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CONSUMPTION AND ITS CURE.

BEING

A POPULAR AND PRACTICAL TREATISE

ON

THE NATURE, CAUSES, SYMPTOMS, AND RATIONAL TREATMENT OF
TUBERCULOUS DISEASE OF THE LUNGS, AND THOSE AFFEC-
TIONS OF THE NOSE, THROAT, AND AIR-PASSAGES, AS
CATARRH, LARYNGITIS, BRONCHITIS, &c., WHICH
GENERALLY PRECEDE OR ACCOMPANY IT

WITH

CASES

ILLUSTRATING THE SUCCESS OF THE TREATMENT.

BY

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&c. &c.

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PREFACE.

THE evident desire which exists in the public mind to acquire information in every department of human knowledge, is answered in a variety of ways by the publication of books explaining in simple language the principles of general science and the details of special subjects. But comparatively little has been done, as yet, with the view of imparting information on the nature, causes, and management of disease. There are several works on Domestic Medicine which aim at instructing the public how to treat diseases by specific prescriptions, described as being useful in particular kinds of ailment. More than this appears to me to be requisite. The description of a single malady, embracing its nature, causes, symptoms, and the best method of its treatment, as well as those means of prevention which are within our control, written so as to be intelligible to all classes of readers, ought to be acceptable and must be productive of benefit.

The vast interest, which attaches to the consideration of a disease so prevalent and so fatal as consumption, justifies every effort to render a knowledge of its essential nature available to the public.

Actuated by this impression and stimulated by the conviction that a strong desire for information does exist in the public mind, I have endeavoured to explain, in a brief narrative, all the facts of importance with regard to this disease, and to render my subject popular and intel-

ligible to the general reader by excluding as far as practicable all technical language.

In describing the symptoms, causes, and treatment of lung disease, this fortunately can be done without wounding the sensibilities or unnecessarily awakening the alarm of the reader.

Few attempts have hitherto been made to accomplish all the objects that I propose to myself in writing this treatise, and those have been chiefly confined to the consideration of the benefits to be derived from residence in particular localities.

The high reputation of the numerous standard works on this subject is not alone sufficient to attract the attention of general readers, and hence much that is essentially valuable and absolutely necessary to their welfare remains unknown to them.

Next in importance to a clear knowledge of a disease, and the various causes which may produce it, is undoubtedly the question of its proper treatment, and this is really the only point of vital interest to those who suffer from any form of lung disease. The change which has taken place, within the last few years, in the treatment of all diseases, has also unquestionably modified the practice with regard to those of the respiratory organs. I have therefore entered largely into the consideration of a system of treatment which has recently been much extended and improved, and the success resulting from which has been such as to warrant the highest expectations of its universal adoption, and ultimate benefit to mankind.

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INTRODUCTION.

THE term "Consumption" was originally applied to many diseases situated in different organs, and having no symptom in common except the wasting or emaciation of the body. This use of the term led to very great confusion among writers, and it was found necessary to designate the variety of consumption which they intend to describe. But as the study of pathological anatomy became general, it was discovered that disease of the lungs was more frequently the cause of chronic decay of the body than all the others combined, and hence arose that restriction of the name to tubercular affections of the lungs only; and this acceptance of the term is the one which I intend to keep in view in the following pages.

It is a disease with which, unhappily, we are too familiar in this country: there are few who have not to mourn the loss of some relation or friend taken from them, it may be, in early life, or after a period of association which had strengthened the ties of feeling existing between them. It spares no age or condition of life, finding its victims equally amidst those who are more exposed to its assaults, and those who are able to surround themselves with the best precautionary means of warding off its attacks.

It has heretofore defied all efforts to arrest its progress and avert its fatality. It unquestionably extends itself in all communities coincident with the spread of civilisation. The adoption of artificial modes of life would seem to render the

constitution more prone to its inroads, while the increase of population, and the too frequent intermarriage of persons with contaminated constitutions, afford it abundant material for its ravages. The importance of the subject, therefore, can scarcely be overrated.

The frequency of its occurrence is established by the most partial glance at the recorded statistics of its mortality. It has been computed from these records that upwards of 71,000 persons die annually from this disease, which would be about 1 in every 300 of the entire population; and Sir James Clark, in his work on pulmonary consumption, says—"It has been calculated by the late Dr. Young, Dr. Woolcombe, and others, from the best data which the bills of mortality afford, that in Great Britain and Ireland consumption causes a fourth part of the deaths that occur from disease."

It is true that there are other forms of disease assailing the lungs which are very frequent and very fatal, and many of these have been undoubtedly frequently mistaken for consumption; but even admitting this, we still find that none of them are comparable to this disease in fatality.

Within a few years, owing to a more exact compliance with the true principles of mortuary registration, a considerable proportion of deaths, which were formerly recorded under the head of phthisis, are now placed under that of bronchitis; the result of which is that the mortality from the latter disease has been made to appear numerically greater than that from consumption.

Whether this be an error of computation, or is due to the fact that the whole mortality from acute and chronic bronchitis is classified under the single head, or whether the improvements in science have enabled physicians to discriminate more

completely between the chronic form of bronchitis and true tubercular consumption, is a subject open to discussion.

Experience has taught us that in all diseases in which the respiratory organs are implicated, especially in chronic cases of long standing, there is always a manifest tendency to ultimate destruction of the lung tissue, accompanied by depreciation of the vital powers, more or less rapid according to the extent of the lungs involved. This connection it is which has led to the conclusion arrived at by many writers, that they must be to a great extent regarded in the light of cause and effect. I am free to admit that a difference of opinion does exist on this point, but inasmuch as the same may be said with regard to many other pathological questions, it should not deter us from accepting it as true, particularly when we are able to point out what appear to be good reasons for the opinion—these reasons being founded on facts which are within the observation of every one who is familiar with these diseases.

If this view of the close relation existing between them be correct, then there can be no question that such a result would obtain more readily when there already existed any constitutional tendency to tubercular disease of the lungs. That catarrh, bronchitis, and some forms of asthma are the frequent precursors of phthisis is generally admitted; the reasons for which these may be regarded as causes of this disease will be found fully discussed in the section on the "Causes of Consumption."

When true consumption exists as the primary disease, the occurrence of any of those just alluded to will, of course, greatly aggravate the condition of the patient; increase the difficulty to be encountered in the treatment; and hasten the progress of the disease. Under such circumstances their

removal becomes a necessity ; and it is fortunate that the local method of treatment advocated in this treatise is equally applicable to these different maladies.

When consumption is apprehended, without the preceding occurrence of any of these diseases, it becomes a matter of the greatest importance that its existence should be detected as early as possible.

The improvements, which have been introduced for examination of suspected cases, have placed within our reach various appliances and methods of procedure. In order to avail himself successfully of these means, the eye and the ear of the physician must be early educated in their use.

Among the examinations which are necessary I would first allude to inspection of the general form of the body, particularly of the chest, with relation to its size, mobility of its walls, position of the collar-bones, shoulders and ribs, these being essential points ; and the facility of distinguishing any departure from the natural appearance of this region must depend upon the practised eye of the observer. The regularity with which the act of breathing is performed, and the difference, if any, which exists between the action of both sides of the chest, must be carefully noted. The accordance between the respiration and the frequency of the pulse will also demand close attention.

The complexion and expression of the countenance, and the presence or absence of any of those indications which are known to denote certain constitutional conditions, must not be lost sight of. These are the points which demand that faculty of observation which education of the eye alone can give.

For the detection of those which are technically termed the physical signs, the employment of certain instruments is necessary. In order to determine any departure from the natural

standard of respiration, an instrument called a Spirometer is employed. This instrument was perfected by Mr. Hutchinson, and the observations which he conducted by its means have thrown much light upon the physiology of respiration, and resulted in the establishment of what is technically termed the 'vital capacity,' based upon the phenomena of inspiration and expiration. These phenomena are found to bear a close relation to the height of the body.

The following table has been constructed as the result of experimental researches by numerous observers:—

TABLE OF THE VITAL CAPACITY IN RELATION TO HEIGHT.

Height.		Regular Progression.	From Observation.	Height.		Regular Progression.	From Observation.
Ft. in.	Ft. in.	Cubic inches.	Cubic inches.	Ft. in.	Ft. in.	Cubic inches.	Cubic inches.
5 0 to 5 1		174	174	5 6 to 5 7		222	229
5 1 to 5 2		182	177	5 7 to 5 8		230	228
5 2 to 5 3		190	189	5 8 to 5 9		238	237
5 3 to 5 4		198	193	5 9 to 5 10		246	246
5 4 to 5 5		206	201	5 10 to 5 11		254	247
5 5 to 5 6		214	214	5 11 to 6 0		262	259

From this table it will be perceived that there should be a regular increase of eight cubic inches of air for every inch of stature. But as the result of many thousand observations, a variation from this regular progression has been noticed, this variation probably depending upon differences of conformation and muscular development.

It is obvious, therefore, that whenever any great difference exists between this natural standard and the actual power of respiration in those under examination, not to be accounted for by malformation, muscular debility, or any similar causes, we

are justified in suspecting the existence of some obstruction to the function, situated within the lungs.

The measurement of the dimensions of the chest is a subject of much interest, and materially aids the physician in detecting those defects which may indicate the existence of a want of proper development, in itself an exciting cause of the disease.

The external dimensions differ in individuals, and this must be apparent to every one. From an interesting table prepared by a careful observer from a large number of admeasurements (the calculations being made from three classes, according to weight in relation to height), it appears that every increasing inch of stature causes the smallest chest to increase on an average nearly four-eighths of an inch; the medium size rather more; and the largest size five-eighths.

Mr. Hutchinson found a regular arithmetical progression in the circumference of the chest in relation to the weight of the body. It would seem that the chest increases exactly one inch for every ten pounds increase of weight; this, however, is without reference to height, which cannot be well omitted from such calculations, as the height always influences the weight of the body.

The following relational proportions of admeasurement have been established by another observer:—Twice the breadth of the shoulders equals the circumference of the chest. Four times the distance between the nipples is equal to the circumference. It must be remembered, however, that this distance is relatively less in women than in men. Four times the depth of the chest is equal to its circumference; so that the depth of the chest and the distance between the nipples is, or ought to be, equal. At the height of 5ft. 9in. the depth of the chest varies from $7\frac{1}{2}$ to $12\frac{1}{4}$ inches.

These admeasurements indicate, it must be understood, the proportions of a well-formed chest in a full-grown, healthy person. Any departure from these proportions may lead to the suspicion of some fault within that cavity; the external conformation of the chest being modified by a variety of circumstances, such as age, sex, and the influence of occupation and disease. All these points must be taken into consideration in the examination of each individual case.

It is a popular belief that there is a close relation between the volume of the lungs and the vigour of the constitution, but this is erroneous; nor does the amount of air which can be respired bear anything like an exact relation to the size of the cavity of the chest. A small chest may in some persons admit of a deeper inspiration than a large one in others. This difference would seem in a great measure to depend upon the mobility of its walls, precisely in the same way as the volume of the blast from a pair of bellows is more dependent upon their movability than on their absolute size.

In the act of healthy respiration, when we apply the ear to any portion of the chest, three sounds, produced by the breathing, may be perceived; those which are occasioned by inspiration and expiration, and that which is caused by the passage of the air through the cells of the lungs.

A perfect knowledge of the character of all these sounds, in the healthy state, is indispensable to the physician who seeks to discover the existence of disease within the lungs, or to determine its probable nature. From the instrument called a Stethoscope he derives material aid; for by it the sounds are intensified and made more distinct. This instrument is a simple tube made of some hard material, and adapted at one end to fit smoothly on the chest of the patient, and at the other

to cover the ear of the listener. There is also another form of this instrument by which the physician is able to employ both ears at the same time, which possesses great advantage over the single tube.

The object of this method of examination is to detect those departures from the natural sounds which are known to indicate the presence of disease, as well as to recognise the special character of those sounds which accompany its various forms.

It requires a nice, acute ear, well educated for the purpose, to distinguish slight departures from the healthy pulmonary sounds, just as a practised eye is necessary to mark the deviation from the proper configuration and relative proportions of the chest, and the character and extent of its movements as influenced by disease; and, indeed, with the best natural endowments this knowledge cannot be attained without the experience, which only years of practice on a large number of cases will confer. Every one ought to be examined regularly at stated periods during the year, and perhaps there are no seasons better suited for this than the broken weather of autumn and spring. Those who know themselves to be exposed to the chances of pulmonary disease, cannot be too jealous in the watch they keep over the earliest perceptible signs of its approach.

In addition to the use of the stethoscope for distinguishing the value of the signs of disease, as denoted by changes in the character of the respiration, we employ percussion to ascertain whether there be present in the lung any of those structural alterations produced by the deposit of foreign matter.

Percussion is best performed by placing the fingers of one hand firmly on the surface of the chest, and tapping them with those of the other hand gently, but with such force as to

produce resonance through the cavity. There are various modifications of instruments employed for the purpose called "pleximeters," but none of these equal the fingers in practical utility.

On striking the healthy chest in this manner a clear sound is easily produced ; should there be, however, present within the cavity of the chest any products the results of disease, this sound will be altered in character according to the density of the deposited matter, its nearness to or distance from the surface ; a dullness is produced which will be circumscribed or diffused according to the extent of this deposit. This change of sound guides the physician in determining upon the position, extent, and probable nature of these deposits. There is also a peculiar but well-marked sound given out by striking the chest over the region of a cavity.

This mode of investigation becomes an invaluable aid in determining the existence of disease within the chest, and frequently forms a safe guide in the earliest period of tuberculous disease.

For the examination of the condition of the mucous membrane lining those passages which are accessible to sight, a small instrument made of highly-polished metal which acts as a reflector for condensing and throwing the light into them is employed ; and for the exploration of the larynx and windpipe an elaborate but highly-interesting apparatus called the "Laryngoscope" has been lately invented.

With this little instrument the more remote parts can be easily examined, and the existence of diseased conditions detected, which were formerly merely a matter of surmise and uncertainty.

The advantage which medical science has gained in recent

years from the facilities offered by these several modes of investigation admits of no doubt. We can no longer be said to grope in the dark with regard to these diseases. We can measure the extent and determine the nature of the mischief which has been done to so vital an organ as the lung, and all who neglect to avail themselves of these means fall short of their duty to their patients, while those who object to their use deprive themselves of the benefits which are to be derived from their proper and judicious employment.

The great object to be attained in seeking to discover the nature of any disease is to enable the physician so to regulate his treatment as to promote its cure, and this, after all, is the only matter of any real interest and importance to those who are the victims of consumption.

We can hardly be surprised that with a knowledge of the large mortality resulting from this disease, the idea of its incurability should have obtained possession of the popular mind, and should have influenced, to a great extent, even the opinions of medical men. Some people are so thoroughly convinced of the impossibility of curing it that they condemn all efforts to accomplish this desirable result, and even stigmatise them as empirical.

The question of curability is one which has engaged the mind of the profession for a long period of time, and the conviction has been growing stronger every day that, with improved knowledge as to the true nature and source of the disease, and the confidence engendered in the minds of consumptives by this fact, we shall be able to adapt the treatment to the requirements of each case at an earlier period, and on a more scientific and rational basis, than has hitherto been done.

It would be easy to show that the curability of consumption

is a portion of the professional creed of many distinguished physicians.

The following extracts will be sufficient to illustrate this :—

Laennec, one of the most profound investigators of this disease, records his opinion in the following words :—“ Recovery in cases of consumption, where the organ has not been wholly invaded, seems to me to present no character of impossibility, either as regards the nature of the disease or that of the organ affected.”

Sir James Clark, another eminent authority, tells us—“ That pulmonary consumption admits of a cure is no longer a matter of doubt ; it has been clearly demonstrated by the researches of Laennec and other modern pathologists.”

Professor Carswell, probably the greatest pathologist England ever produced, observes—“ Pathological anatomy has, perhaps, never afforded more conclusive evidence in proof of the curability of a disease, than it has in that of tubercular consumption. . . . The destruction of a part of the substance of the lungs is by no means necessarily mortal.”

Dr. Hughes Bennet, Professor of Medicine in the University of Edinburgh, thus speaks on this point :—“ The fact of the recovery from phthisis pulmonalis, even in its most advanced stage, can no longer be denied.”

Dr. Swett, an American writer of great authority in his country, remarks—“ Another important question presents itself. Is consumption a curable disease? The general impression in the medical profession is, that a patient with consumption is doomed to death. . . . I have known a number of patients during the last fifteen years who have had the evidences of consumption, and sometimes in an advanced stage, who finally recovered, and are now in the enjoyment of good health.”

Dr. J. Henry Bennet, in a paper on the treatment of pulmonary consumption, also records his testimony in favour of the curability of the disease as follows :—"The fact to which I have to testify is, that pulmonary consumption is a curable disease—indeed, in its early stages a very curable disease—under proper treatment."

And Dr. Cotton, whose experience in this disease is unquestionable, says—"The possibility of tubercle becoming absorbed has been much questioned; but I have witnessed so many instances in which recovery was complete, and all evidence of pulmonary disease was entirely dissipated, after every general and physical symptom of tubercular deposition had been most unmistakably manifested, that I cannot for a moment doubt its occurrence—less often, it is true, than we could desire, but sufficiently frequent to encourage a hope, and to lead to a steady perseverance in those measures which are likely to promote it."

In reflecting on this subject the question naturally suggests itself, Why should consumption be incurable? That it has defied the therapeutic means hitherto employed is no reason why it should for ever remain beyond the reach of our curative efforts. As the revelations of science have made us better acquainted with the nature of this disease, surely the application of those principles which a more extended knowledge of it, of the properties of remedies, and, above all, of a different method of administering them, will make our efforts more successful in the future.

It cannot be denied that much of the want of faith in the power of medicines to cure this disease arises from the failure which has hitherto attended their administration solely by the stomach. This failure has been acknowledged by authorities

competent, from their great experience and abundant opportunities of observation, to form a correct judgment on this very important point.

Sir James Clark, whose opinions I have already freely referred to, says—"The total inefficacy of all means hitherto adopted for diminishing the frequency or reducing the mortality of this class of disease, is of itself sufficient incitement to us to seek for some other method of remedying the evil."

Dr. Davies, Consulting Physician to the Infirmary for Asthma and Consumption, remarks in his lectures—"I now arrive at the least satisfactory part of this subject, I mean the treatment of consumption; for I am convinced that art has done little more than palliate this disease."

And Sir Alexander Crichton, a leading authority in his day, observes—"That pulmonary consumption cannot be cured by medicines which act through the medium of the stomach, the whole history of our art proves to us."

A greater number of authorities on this subject might easily have been selected, but I think I have quoted sufficient to establish the point; it may not, however, be unadvisable, in commenting upon this failure, to review to some extent what the general features of treatment heretofore pursued have been.

Under the erroneous impression that consumption was the result of inflammation of the structure of the lung, *blood-letting* was proposed and largely employed, but was ultimately given up; partly in consequence of disappointment at the results obtained, and partly in accordance with the general abandonment of this method of treatment.

The administration of *emetics* was also carried to a very great extent, and obtained a considerable amount of favour with most practitioners, under the impression that the digestive functions

were chiefly at fault, and that by the use of these medicines expectoration would be favoured, and the lungs would thus be thoroughly relieved. Another of the older remedies relied upon was *mercury*, given in some of its various preparations. This at length fell into disfavour, and came to be regarded with great distrust, even to the extent of supposing it to be capable of producing the disease. Few, however, now employ this medicine to produce salivation, as was formerly done ; while a large majority of physicians condemn its use in consumption altogether as being extremely prejudicial.

The administration of *digitalis*, as a sedative and diuretic, was at one time greatly extolled as a specific, although various opinions prevailed as to the exact method of its operation ; by some it was regarded as a stimulant, by others as a tonic, and by many merely as a sedative. The benefits derived from the employment of *iodine* in many forms of scrofulous disease suggested its administration also in consumption. Experience, however, has proved that although a most powerful medicine for correcting diseased action, when carefully used in proper forms and doses, yet it cannot justly be regarded as a specific in this disease, while its action on the stomach is often hurtful.

The practice of applying irritating substances to the skin, commonly called '*counter-irritation*,' is one of very old date, and when judiciously employed is doubtless a valuable aid to treatment, but more for the purpose of subduing local congestion, which is so apt to occur during the progress of any form of lung disease, than for any influence they can exert on tubercular deposits, or on the various changes which these undergo. The last and most favoured specific remedy, which still enjoys a high reputation, is *cod-liver oil* ; but even with regard to this a certain amount of reaction has taken place

both in the public and professional mind, and the conviction obtains that it has no curative power whatever; any good effects resulting from its use appear to depend entirely upon its nutritive properties.

This point I shall somewhat enlarge upon under the head of 'The Curative Treatment of Consumption.'

It is evident, therefore, that palliative treatment is the one alone which would seem to enjoy any degree of confidence, and that notwithstanding all that has been written and done upon the subject of consumption, we are still totally unacquainted with anything like a satisfactory method of cure conducted through the medium of the stomach; for, as Dr. Billings very forcibly remarks in his *Principles of Medicine*, "The application of remedies in phthisis has been in many cases empirical, often inert, and sometimes mischievously active."

The progress in the art of medicine justifies us in anticipating that the cure and comparative extinction of phthisis are among the benefits we may reasonably hope for, when the acquaintance with the true merits and scientific nature of the system of treatment advocated in the following pages becomes more general, and that it will be universally adopted, and will open up to us a still wider field of therapeutic success in our contest with pulmonary diseases.

At a very early period in the history of medicine we find evidence of a conviction prevailing among physicians of the advisability of exhibiting medicinal substances, in diseases of the respiratory organs, by means of the function of respiration. This method of administering medicines is called "inhalation." It consists, not in giving one peculiar remedy, but in a particular method of giving many remedies. That is to say, the medicines inhaled are not alike in all cases, nor even in all

stages of the same case. We may swallow a purgative, an emetic, or an opiate, and though all are taken in the same manner and pass into the same organ, yet each produces a different effect. So it is with inhaled medicines; these are adapted to the condition of the lungs, in the same manner that we adapt those given by the stomach to the object to be accomplished by their use. The physician prescribes one inhalant to soothe, another to promote expectoration, a third to allay spasm, a fourth to stimulate secretive function or to control its excessive action, and a fifth to purify the blood and remove morbid deposits. I am aware that much misapprehension exists on this subject. Some regard it as a particular medicine applicable to all cases, others as several specific medicines, each adapted to the cure of a particular kind of disease; but it is neither a nostrum nor a panacea; it is simply a rational and scientific mode of exhibiting medicinal compounds. It is a system of practice as complicated and requiring as much judgment and experience for its employment as the administration of medicines by the stomach.

The great error into which the earlier advocates of inhalation fell was the vain search after a specific remedy applicable to every form of pulmonary disease. Instead of striving to reduce the facts within their knowledge and experience to a system, and to avail themselves of the observations of others in order to establish rules for future guidance, they occupied themselves in arguments about the relative merits of certain remedies, and by this means the practice never attained that importance to which it was entitled, but gradually passed into comparative forgetfulness without having been submitted to any extended series of experiments, and before it was possible to form any estimate of its real value. Within a few years

renewed attention has fortunately been directed to this subject, and with every promise, not only of establishing it firmly, but also enlarging the sphere of its utility.

In order to show the feeling of the medical profession on the desirability and utility of this method of treatment, I subjoin a few brief extracts which could easily have been multiplied from the numerous works written on this subject. No amount of assertion, even if it should proceed from the oldest and most highly regarded authorities, can overturn the evidence of one well-authenticated fact; but it is at all times very satisfactory that those opinions which a physician holds should be sanctioned by the teachings of the most respectable authors of every age, and it is with this view that I select the following:—

Dr. Forbes, the editor of the *British and Foreign Medico-Chirurgical Review*, tells us in an article on Asthma that “reason, analogy, and experience unite to justify the inhalation practice.”

Dr. Hyde Salter says—“The air-passages are peculiarly favourably placed for this topical medication, and the movements of respiration supply us with a natural and easy means of conveyance. Inhalation, indeed, has all the advantages of local treatment—its concentration, its manageableness, and rapidity of result.”

In Dr. Carpenter's work on Physiology, which is one of the standard text-books of the profession, I find the following remarks:—“The pulmonary surface affords a most advantageous channel for the introduction of certain medicines which can be raised in vapour, when it is desired to affect the system with them speedily and powerfully; and it is most astonishing to witness the extraordinary increase in potency which many

substances exhibit when they are brought into relation with the blood in the gaseous form."

Dr. Abbotts Smith, in his work on Consumption, thus speaks on this point:—"Inhalation, like every other remedial means, cannot always succeed; but its great value in the treatment of a large proportion of pulmonary, bronchial, and laryngeal disorders is daily becoming a more generally recognised fact."

Dr. Riadore, treating on the subject of the inhalation of oxygen, says—"From very extensive trials for some years past, I am fully satisfied that cases of consumption are remediable and often curable by inhalation of some of the gases, that would inevitably prove fatal by depending upon administering medicines by the stomach according to the usual system.

. . . The results of the practice, and *post-mortem* examination of some scores, convince me that the disease may both be arrested and cured by the plan of applying gases and vapours to the seat of the disease, in whatever part of the lungs it may be seated."

In an editorial comment on a recent publication the *Lancet* remarks—"The utility of topical medication of the air-passages, by the inhalation of the vapour of water impregnated with various substances, is extensively recognised by the profession. The absence of any simple and efficient apparatus for the purpose is often the only reason why the great relief which such applications are capable of affording is withheld from the patient."*

Dr. Reid, whose extensive researches on the influence of the atmosphere in disease is well known, observes—"Medical men have long and justly been jealous of any interference with

* *Lancet*, February 11th, 1865.

organs so important in their functions and so delicate in their structure as the lungs ; but if a proportionate delicacy and care be employed in the remedies applied, certainly no field holds out a more promising path of inquiry than that which is presented in investigating the influence of atmospheric air on the person, and the varied materials which can be mixed with it, and thereby brought to bear more gently and unconsciously on the system, than by any other mode of treatment."

In the writings of Scudamore we find ample materials for illustrating this point, but I think the following passages especially valuable :—"The diseases in which I consider it proper to adopt the inhaling method are some kinds of cough, certain asthmatic conditions of the air-passages, chronic bronchitis, and, above all, tubercular consumption. . . . I have in several cases succeeded in producing the absorption of tubercles by the continued influence of the inhalation of iodine. . . . I also believe that it does, in the most favourable manner, assist the softening process when the disease has come to that stage, causing a more free expulsion of the tuberculous matter by expectoration, inducing a more healthy condition of the bronchial mucous membrane, very probably dispersing crude tubercles by the stimulus given to the absorbents ; and, finally, assisting the healing process in the ulcerated cavity."

Among French writers Cottereau, Louis, Gavarret, and Gannal all speak in the highest terms of this method of treatment.

The last writer says—"That chlorine gas, diluted with a large proportion of common air, and softened further by its combination with aqueous vapour, is a powerful therapeutic means of cicatrising ulcers of the lungs, where they exist, and of preventing their formation when a predisposition is indicated."

The late Dr. Maddock, who successfully practised this method of treatment, bore ample testimony to its value, as the following passages from his work will show :—" Although the reasonableness and importance of inhalation, or the local action of medicated vapours in diseases of the air-passages and lungs, cannot be questioned, it must be admitted that it has not obtained for itself in this country that extent of inquiry and examination which it deserves. . . . And yet it is not easy to imagine how this mode of treating diseases of the breathing organs should have been neglected, its feasibility is so self-evident, and in such accordance with the theory, principle, and practice of medical science, and the teachings of common sense ; for it is an admitted fact that remedies directly applied to the absorbing surface of the lungs, independently of the specific local influence they exert, are carried into the system and produce analogous effects as when directed to the surface of the stomach. . . . We shall incontrovertibly show, not by theoretical speculations, but by facts furnished by the experience of highly-talented practitioners, and of ourselves, that pulmonary consumption in certain stages of the disease is positively curable, and that, under the most adverse circumstances, it is possible to afford extraordinary alleviation of suffering by a judicious use of medicated inhalations. . . . The *rationale* of inhalation is exceedingly simple, indeed nothing can be more simple ; and it will be at once evident to any person who will give the matter one minute's consideration that this plan of treatment is based upon strictly scientific and correct principles, for it requires no professional learning to perceive that, from the relative position of the stomach and lungs, remedies must necessarily be more effective in diseases of the lungs when introduced into the whole aërial cavity and to the absorbing

surfaces of these organs, than when exhibited through the stomach, where they must undergo great and unknown changes from the process of digestion, &c., and can only reach the seat of disease by means of the circulation."

Surely nothing more is required to establish the fact of the recognition of the principle of local treatment in diseases of the lungs and air-passages than the extracts given above, and the results, which repeated observations have verified, point to its success.

The basis upon which this mode of practice rests may be explained in a few words. The air we breathe is more immediately concerned in the production of disease than any other influence to which we are exposed. It is subject to changes in its *temperature*, in its *density*, and in the amount of *impurities* which it contains, all of which directly affect our health. It impresses locally on the internal surface of the lungs the influence of every change in its condition. Through the lungs it acts on the blood, and through the blood on every organ, and muscle, and nerve of the body.

The causes upon which these effects depend are inhaled into the lungs. Now it is quite as practicable to mingle with the air we breathe substances calculated to counteract any noxious matter thus taken into the system, and also substances which will act on the tissues of the lung precisely as they would on every other tissue to which they may be applied, in accordance with their well-known curative properties. The advantage of the minute subdivision of medicinal substances to be administered by the stomach has long been recognised, as is shown by the preference given to solutions over solids, and also in the careful grinding employed when medicines are given in the form of powders or pills. As vapour is only a more extended

application of this principle of subdivision, it is a still more desirable form of administration, and its potency has been admitted by more than one writer ; indeed, it is characterised as acting with the “rapidity of touch.”

From close observation and experiment, the following conclusions have been arrived at in relation to the action of inhaled remedies :—

1st. That there are no medicines which can be volatilised that may not be inhaled with safety under proper precautions as to quantity and kind.

2nd. That the doses of medicines by inhalation cannot always be determined or regulated by those which are given by the stomach.

3rd. That the action of many remedies when inhaled differs from that of the same remedies when taken into the stomach ; their use cannot, therefore, be altogether governed by those rules which guide us in their administration through that organ.

4th. That every local effect, such as cleansing, soothing, and stimulating, which can be produced by local applications to ulceration on the surface of the body, can also be produced on ulceration in the lungs by suitable inhalations.

Theorising with regard to the action of medicines never yet produced any beneficial result ; there is but one test of their efficacy, and that is success. We have no right to assume any fact with reference to the effect of any medicine, but whatever is established as the fruit of experience cannot be controverted, and is above all theory.

Most successful results have been attained from the use of inhalation in the treatment of acute and chronic catarrh, œzena,

diphtheria, laryngitis, croup, bronchitis, whooping-cough, asthma, and consumption in all its stages, to the consideration of the last of which this treatise is mainly devoted.

I think I have now said enough to lead all to hope that a life of greater usefulness will be opened up to the physician, by a more rational application of the principles of medicine to the cure of pulmonary diseases.

PART I.

DISEASES WHICH PRECEDE OR ACCOMPANY
CONSUMPTION.

BEFORE proceeding to describe the symptoms by which consumption declares itself, it will be necessary to give a short description of certain diseases of the nose, throat, and air-passages which generally precede or accompany this disease.

Unfortunately, these affections are too generally treated as very trifling complaints, and in many instances are allowed to assume a chronic character, the patient losing sight of the dangerous consequences which may arise from such neglect. It is of the utmost importance, therefore, that all these affections should be thoroughly understood and promptly treated, as I regard the connection existing between them and consumption to be the most important feature in their history.

The whole of the breathing apparatus from the external orifices—the nose and the mouth—is lined with a delicate membrane. This membrane extends upwards into two cavities of considerable size, situated above the roof of the nose, called the “*frontal sinuses*,” and downwards lining the throat, the larynx, the windpipe, and the bronchial tubes. In its healthy state it is kept moist by a natural secretion from which it takes its name—mucous membrane; on the absence or altered condition of which the chief features of the different affections depend.

Congestion or inflammation of this membrane produces various diseases which are called by different names according to the parts implicated. Thus inflammation of the lining membrane of the frontal sinuses is called *influenza*; of the nose, *catarrh*; of the tonsils, *tonsillitis* or *sore throat*; of the larynx, *laryngitis*; and of the bronchial tubes, *bronchitis*.

It often happens, however, that in the same attack all these parts are successively or simultaneously the seat of inflammation; it may therefore be said to constitute one disease, differing in name from the locality, and in severity from the importance, of the part affected.

CATARRH, INFLUENZA, AND ŒZENA.

Acute catarrh, or, as it is popularly termed, "a cold in the head," is, as I have just stated, an inflammation of the mucous membrane lining the passages of the nose. It is one of the most frequent affections in this variable climate, no age being exempt from it, and few persons escaping entirely from an attack during the winter months.

The symptoms of catarrh are first a sense of heat, irritation, and stuffing of the nose. This arises from congestion and swelling of the mucous membrane, and an absence of the usual secretion. After a few hours a clear irritating water is secreted in large quantities by this inflamed membrane, and runs freely from the nose, producing redness and smarting where it comes in contact with the skin. Gradually this acrid water becomes thicker, less irritating, assumes a yellowish colour, and peculiar odour. As this change takes place the irritation subsides, the nostrils again become free, the stuffing in the head passes off, and the secretion diminishes until the health of the patient is fully re-established.

This is the usual course of the complaint when it is confined to the nose; but when the inflammation is more extensive and attacks the frontal sinuses, all the symptoms are increased in severity. There is a feeling of lassitude and weariness, with pains in the limbs, chilliness, and severe headache, principally confined to the forehead. The skin becomes hot, the pulse increased in frequency, and soon afterwards cough comes on, with evident signs of mischief going on in the chest. This affection often produces other troublesome symptoms, as deafness and singing in the head, from the extension of the inflammation along the eustachian tubes of the ears. This form of catarrh, or, as it is generally called, *influenza*, frequently attacks a great number of individuals at the same time, constituting one of those epidemics which sometimes occur with periodical regularity, and are at certain ages and under certain circumstances of season often fatal, more especially in those labouring under some form of chronic disease, such as consumption.

Chronic catarrh most frequently follows an acute attack, and is generally the direct consequence of leaving "a cold" to cure itself. It may, however, come on slowly from the long-continued action of any exciting cause.

Irritating powders are apt to produce this effect when inhaled. Thus it is that millers and those employed to dress feathers and hair are very frequent sufferers from this complaint. It is met with in varying degrees of severity, probably greatly depending upon the constitutional strength of the patient and the duration of the attack.

The symptoms which indicate this affection are similar in character to those seen in the acute form of the disease, but the secretions are not so copious, thicker in their character, produce constant irritation, evince a tendency to collect and harden in

the nasal passages frequently forming scabs, which, when removed, cause bleeding. In this state there is also a change in the sound of the voice, as if the person spoke through the nose, a loss of the power of smelling, and the discharge acquires a well marked fœtid odour.

Æzema.—When chronic catarrh is neglected or improperly treated it passes on into the confirmed stage of ulceration of the mucous membrane. The discharge now assumes an unhealthy and purulent character, especially in those who are the subjects of constitutional debility, or any form of inherited taint. It is at this stage that the disease is called *Æzema*. The destructive process now going on is such that not only the softer tissues but also the bony structures of the nose are destroyed. In aggravated cases it is not unusual to see portions of these coming away with the discharge. Upon examining the passages the points of ulceration may be distinctly seen.

The constitutional indications of this stage of the disease are loss of flesh, sometimes almost equal to that seen in tubercular consumption; there is also a peculiar pallor of the countenance, with great mental dejection and loss of energy.

Treatment.—The treatment of these affections is unquestionably best managed by local applications, administered by some of the apparatus subsequently described under the section "Treatment of Consumption."

But an efficient and powerful means is also afforded by the injection of medicinal solutions with variously-contrived syringes. The following drawing represents a simple form of syringe, by which a patient can easily make these applications to the nostrils.

It consists of a straight silver tube, closed at the end and perforated with fine holes along its side. This is attached to an elastic bag by an ivory or metal cap. By pressing out the air

and inserting the perforated tube in the solution, the syringe fills itself as the pressure is withdrawn. The patient must then insert the silver tube along the floor of the nostrils and press the bag smartly, when a strong shower is thrown against the sides of the nasal passages, cleansing them and making a direct application to the whole of the inflamed membrane.



It is always desirable, in the first instance, to wash away adhering secretions with warm water, to which it may be useful to add some alkaline substance.

The solutions to be used depend on the condition of the membrane, and must be adapted to each particular case.

The same indications govern the treatment of chronic inflammations of the mucous membrane of every part of the body.

For the purpose of making applications to the fauces and behind the palate the curved syringe will be necessary.

It is shown in the accompanying engraving, which sufficiently explains the principle of its action.

By this instrument all parts of the throat, the opening of the windpipe, the tonsils, and parts behind the palate can be completely washed with any solution that may be considered necessary for the case under treatment.

Although in a large majority of cases the use of this syringe requires the presence of a medical man, yet there are many persons who can be taught to use it for themselves.

By means of these instruments solutions of the salts of zinc, silver, copper, &c., and vegetable infusions of an astringent or stimulant character, have proved successful in effecting the cure of long-standing cases which have not yielded to general or constitutional remedies alone.

I am convinced that many cases have been permitted to attain a degree of severity which might have been averted if these means had been earlier employed, and that aggravated cases of *œzena* and chronic catarrh have yielded, even when regarded as incurable.



SORE THROAT, INFLAMMATION AND ENLARGEMENT OF THE TONSILS, AND ELONGATION OF THE UVULA.

The mouth and nasal passages terminate in one common cavity, called in popular phrase the *throat*, and in professional terms the *fauces*.

The throat or fauces is seen, on looking into the mouth when

the tongue is depressed, below and behind the curtain of the palate. From the centre of the palate a little fleshy organ hangs down behind the root of the tongue; this is the *uvula*. On either side of the entrance into the fauces, and immediately behind and below the outer margin of the curtain of the palate, are two glands—the *tonsils*. These parts are covered by the mucous membrane, continuous with that which lines the nostrils and mouth.

They are all liable to inflammation, terminating in enlargement, abscess, and ulceration, and are also occasionally the seat of tuberculous deposit.

Sore Throat is a general term used to designate several forms of disease of the mucous membrane of the fauces, and also of the mucous glands scattered over its surface.

In ordinary sore throat, occasioned by a cold, there is simply redness and slight puffiness of the membrane, which may subside after a few days, and leave the parts affected in their former condition. This occurs in most persons during each winter, but is thought of so little consequence as scarcely to deserve attention. Not so in reality, however, for each attack leaves an increased liability to a recurrence, and lays the foundation of chronic disease.

This state is accompanied by a troublesome titillation, sometimes dryness, and not unfrequently a difficulty of swallowing, accompanied with considerable pain.

On looking into the throat granulations of various sizes will be seen studding the membrane, and causing it to appear rough and uneven. At times these exist in irregular patches, and each granulation is distinct.

Should the disease progress, the mucous follicles of the larynx also become involved, and then we have huskiness of the voice,

with frequent attempts to clear the throat. At these times a thick sticky kind of mucus is expectorated with considerable difficulty. As this is a purely local affection, it can be rapidly cured by local treatment.

This will consist in suitable applications, made by means of the curved or bag syringe already referred to; sometimes a camel-hair brush becomes necessary for the application of substances which cannot be so well used in solution.

Dry fumigations also are extremely beneficial, and exert a powerful curative action, especially in the ulcerative stage of this disease.

INFLAMMATION AND ENLARGEMENT OF THE TONSILS.

The tonsil glands, which are situated at each side of the entrance into the throat or fauces, are extremely liable to inflammation. And when this inflammation attacks the substance of the glands they not unfrequently suppurate; abscesses form which constitute the disease known as quinsy. The symptoms connected with this troublesome disorder are great difficulty in swallowing liquids, pain shooting along the eustachian tube from the throat to the ears, partial deafness, difficulty experienced in separating the jaws sufficiently to allow the throat to be examined, high fever, rapid pulse and headache. There is always a great amount of constitutional disturbance before suppuration takes place, but the moment the abscess breaks the whole subsides, and in a few days, with proper care and treatment, the parts will be restored to a healthy condition.

Treatment.—This will depend on the patient's habit of body, and on the severity of the attack. If the face is flushed, the skin hot and dry, the pulse quick, and the tonsils with the sur-

rounding parts considerably swollen, it may be necessary to apply a few leeches to the throat. At the same time the bowels should be thoroughly evacuated. A stimulating embrocation, composed of one part of acetic tincture of cantharides and two parts of soap liniment, should be placed upon a piece of flannel, and bound around the neck.

This treatment will be sufficient to check the inflammation, and confine it to the throat. To cut the disease short, and if possible prevent an abscess forming, an inhalation must be employed, such as an infusion of marsh-mallows, elm-bark, or chamomile, with extract of conium, or infusion of poppies. The immediate consequence of repeated attacks of quinsy is a hardening and persistent enlargement of the tonsils. On looking into the throat when both these glands are enlarged, they may be seen narrowing and almost closing up the passage to the fauces, and appearing precisely like two great balls of flesh jutting out from each side. The surface of the glands, under these circumstances, is rough and uneven, giving the appearance of several coverings, the outer one being so broken and fissured as to allow the parts beneath to be seen through the irregular openings. Sometimes one of the tonsils only is enlarged, though more frequently both are affected. These enlarged glands produce most serious consequences on the general health. The articulation becomes imperfect, the speech being thick and guttural. In the child, if the enlarged tonsils are allowed to remain for several years, the defect in speech becomes permanent. Often the enlarged glands press upon the entrance of the *eustachian tubes*, leading from the upper part of the throat to the ear, and by closing them up cause deafness; and this state frequently necessitates their removal by a surgical operation. They act as a constant source of irritation to the mucous mem-

brane of the fauces, rendering the person extremely liable to sore throat, and to fresh attacks of quinsy. They interfere with the freedom of breathing by obstructing the entrance into the windpipe, and thus lay the foundation of disease within the lungs. Another change observed in these glands is wasting of the substance. This is more noticeable in persons of a scrofulous habit, and depends undoubtedly upon some defect in nutrition by which the natural renewal of tissue does not take place.

Ulcers are very frequently found on the surface of these glands, and may last for years, throwing off a morbid secretion which of itself becomes a source of irritation to the surrounding parts. These ulcers are chiefly in persons suffering from constitutional taint.

Elongated Uvula. — As the result of frequent attacks of inflammation the uvula becomes relaxed and elongated, and by falling upon the root of the tongue, sometimes even extending to the opening of the windpipe, it produces a constant irritating cough, which may occasionally be mistaken for that which arises from a more serious cause, such as bronchitis or consumption.

Treatment.—The use of powerful astringent washes applied by means of the syringe, together with appropriate inhalations or fumigations, will usually speedily subdue this condition, but when it resists these means it may be necessary to cut off a portion, which is readily done by a pair of long curved scissors. No ill results arise from this simple operation, and it should always be performed on patients who are suffering from it, more particularly in those who are the subjects of chronic bronchitis or consumption, to whom the constant irritating cough it produces becomes a source of annoyance and even danger.

ACUTE AND CHRONIC LARYNGITIS.

Next in succession to diseases of the nose and throat I come to consider those of the larynx.

The larynx commences at the root of the tongue and extends down below that singular prominence on the front of the neck known as the "apple of Adam." It is composed of several strong cartilages, serving as a framework to protect the delicate organs of voice. Being furnished with vibrating chords, it forms a perfect musical instrument, more or less under the control of the will. The entrance into the larynx is guarded by a little valve, which is attached to the root of the tongue, called the "*epiglottis*."

On the approach of food or drink this little valve prevents these from passing into the windpipe, acting as a sentinel which calls into action the muscles which serve to close this aperture. Below the vocal chords, which are situated from half to three-fourths of an inch lower down, the larynx enlarges, becomes irregular, and terminates in the '*trachea*' or '*windpipe*.' The whole length of the passage to which the name larynx is applied is not more than from one and a-half to two inches. This brief outline of the anatomy will render what follows more intelligible.

The larynx is subject to several diseases, the most important of which, however, is laryngitis.

Acute laryngitis is active inflammation of the mucous membrane of the larynx. At first the patient complains of sore throat, but with this there is generally an indescribable restlessness, and a well-marked anxiety of countenance. Soon a difficulty of breathing comes on, and with it also great inability to swallow. There is pain, sometimes severe, great tenderness on pressure,

and after a few hours a copious secretion is poured out. This secretion has a tendency to become partly organised, and to form a membranous lining, and in this state gives rise to one form of the disease commonly known as "*croup*."

The voice is at first husky, then gradually becomes more and more indistinct until the patient can speak only in a whisper. There is also a peculiar wheezing sound produced by the air in respiration.

As the disease progresses the face becomes livid, the eyes protrude, and are rolled about from one point to another, the patient tosses himself about and gasps for breath, and then gradually falls into a state of stupor.

This is the usual course of the disease when it terminates fatally. It is rapid in its progress, and calls for the promptest and most energetic treatment.

CHRONIC LARYNGITIS, COMMONLY CALLED 'CLERGYMAN'S SORE THROAT.'

This is by far the most important form of laryngeal disease, since it springs from slight causes, and is a very common and most distressing malady. If neglected or improperly treated it always ends in more or less injury to the voice, and too frequently in consumption. The symptoms are generally very mild in the commencement, and liable to mislead the patient into the idea that there is no danger. It usually begins as a severe cold, and is frequently a mere extension of inflammation from a neighbouring part. Sometimes a little pain is felt in the larynx, but more commonly only a tickling sensation which provokes coughing, and an endeavour to clear the throat.

As the obstruction increases the breathing becomes loud and prolonged, and is accompanied by a peculiar whistling sound.

The voice is almost always changed. At first it is hoarse, but as the disease advances it generally becomes more and more feeble until it is scarcely audible. If the ulceration of the vocal chords takes place, there will be a total loss of voice.

One of the first effects produced by chronic laryngitis is a thickening of the mucous membrane. Its surface becomes hard, rough, and irregular, and this state gradually extends to the vocal chords and destroys their freedom of action.

The causes of chronic laryngitis are numerous.

It most frequently occurs from excessive use of the voice, by which the vocal chords are strained and exhausted, and thus lose their vibrating property. Dust and irritating particles in the air are also liable to produce it.

There are various stages of this disease, from the slight huskiness and failure of the voice from which many clergymen, public speakers, and singers suffer, to those destructive ulcerations of the cartilages marked by the total loss of voice, severe and almost constant cough, and expectoration of frothy mucus mingled with pus.

The most intimate connection exists between affections of the throat and those of the larynx. The reason is easily understood. They form but different parts of the same tube, and are lined, as I have before stated, by a common membrane, one over which irritations spread rapidly, and always evince a tendency to travel downwards. The parts are also in immediate contact, and the mucus secreted in the throat becomes entangled about the epiglottis and entrance into the larynx, giving rise to many of the symptoms just enumerated.

This form of disease often occurs in the advanced stage of consumption, from the irritation produced by pus discharged from the lungs. It is one of the most distressing complica-

tions of consumption, and adds considerably to the patient's suffering.

In this form there is always more or less ulceration about the vocal chords, beginning on the lower side and gradually extending upwards. These ulcers often penetrate through the mucous and cellular membrane involving the muscular tissues, and not unfrequently attack the ligaments and cartilages themselves.

Treatment.—In this serious and distressing affection our chief reliance must be placed on local treatment, and this can be by no means so efficiently carried out as by the method of inhalation.

Warm and moist vapours, cold and dry fumigations, and medicinal sprays, are the powerful agents at our command for this purpose.

The physician will find his resources taxed to the utmost in selecting the particular remedies to be used in either form of administration, and the patient will require to second his efforts by a persevering adherence to the treatment prescribed by him.

The necessary inhalations should be used at least three times a day, and continued regularly until the full medicinal action is produced.

It is a very intractable form of malady, and cannot be arrested by any violent measures.

The continued use and constant variation of the substances which are known to exert a beneficial influence on the mucous membrane, are the only means by which we can hope to obtain a favourable result.

When it is the companion of tuberculous disease of the lungs, the necessity for unceasing effort becomes proportionably greater, and complicates the treatment of the lung disease. In

this complication our principal efforts must be directed to the lungs, and this I shall fully consider under another section.

ACUTE AND CHRONIC BRONCHITIS.

In the article on Laryngitis, I stated that the larynx terminates in the 'trachea' or 'windpipe.'

The windpipe is that tube through which the air or breath passes to or from the lungs. It commences at the termination of the larynx, and extends down into the chest, where it divides into two branches, one of which enters the right and the other the left lung.

These branches as soon as they have entered the lungs divide and subdivide into innumerable smaller tubes which ramify in every direction through the substance of the lungs, and terminate in little clusters of cavities which are formed around their extremities like grapes around their stem. These are the 'bronchial tubes' and the 'air-cells.'

Bronchitis is the professional term applied to inflammation of the mucous membrane lining the bronchial tubes.

This membrane is very sensitive to every external influence, and is hence liable to become irritated by sudden atmospheric changes, by impure air, and by the particles of dust which are always more or less present in it. This irritation leads to inflammation of the membrane, deranges its healthy action, changes the character of its secretions, and sets up a train of symptoms to which the above name is applied.

There are two kinds of bronchitis—*Acute* and *Chronic*.

Acute Bronchitis.—This is one of the most common diseases to which the respiratory organs are liable.

It generally commences as a catarrh, attended by pain over the forehead and a sense of stuffing in the nose. The irritation

extends rapidly to the throat, causing the tonsils to swell and the fauces to become inflamed. Gradually the inflammation extends to the larynx, and a feeling of roughness is experienced in the windpipe, accompanied by hoarseness, partial loss of voice, and irritating cough. Then follows a tightness across the chest and great oppression of the breathing. The cough is at first hard and without any secretion, but after a time a thin, saltish, irritating water is discharged, which rapidly increases in quantity, becomes thick and less salt to the taste, and afterwards yellowish in colour.

In this form of disease the constitutional disturbance is usually very severe; there is a great feeling of lassitude and pain across the loins, the pulse is quick and full, the tongue loaded with white fur, the skin is hot and dry, and there is considerable thirst.

If the disease be promptly treated the cough gradually abates, the feverish symptoms cease, the pulse loses its frequency, the difficulty of breathing passes off, and the health is fully re-established. An attack of this description generally entirely subsides at the end of a week or ten days.

Treatment.—In the treatment of acute bronchitis, the control of the constitutional disturbance will naturally engage the chief attention of the physician, but unquestionably the relief to the local symptoms can be only effected by local remedies. There is no disease of the respiratory organs in which the effect of properly conducted inhalation is more marked than this. Warm and moist vapours properly medicated, especially in the early stage of the disease, are most valuable, those particularly which are calculated to promote expectoration, and soothe and allay the irritation which accompanies inflammation.

In children who are very subject to this disease the medi-

cation of the atmosphere of the room will prove beneficial, and may become necessary in consequence of the difficulty frequently experienced in getting them to use an inhaling instrument.

When, however, this is practicable, the good effects of this method of treatment are almost immediately apparent; the disease yields before the strength of the patient is exhausted, and recovery is therefore more rapid than under any other form of treatment.

Chronic Bronchitis.—As I have already stated with respect to catarrhal affections of the nose, throat and windpipe, when the acute inflammation does not entirely subside, but continues for some time in a less active form, bronchitis is said to become chronic. This form of bronchitis may also be induced by certain causes, without any preceding acute attack.

When this condition exists, it may very properly be called “catarrh of the lungs.” It is one of the most common affections in this country, and, as I pointed out in the introduction of my subject, causes a very large portion of the mortality from chest complaints. It is very fatal to aged persons, and in the middle period of life presents nearly all the symptoms of tubercular consumption, so much so that until recently a large proportion of the deaths caused by it were recorded under the class of phthisis. When chronic bronchitis occurs, whatever be its cause, the patient finds that although during the warm months of the year he does not cough much, yet there is always a sense of irritation present which provokes the effort to “hawk” and “clear the throat.” There may not be any expectoration, or probably there will be a little pellet of a bluish-white jelly-like mucus coughed up in the morning, and this may be repeatedly done during the day, especially in damp, chilly weather. Should

there be at the same time any disturbance of the digestive functions, by which either the stomach or liver is implicated, these symptoms are very generally attributed to this cause, and the patient consoles himself that it is a "stomach" or a "liver" cough, which will subside when these organs resume their proper functions. At times the cough comes on in severe paroxysms or "fits," and then it is regarded as a "nervous" cough, more particularly if there should not be any expectoration. These, however, are vain delusions. It is quite possible that during an attack of dyspepsia or of congestion of the liver, bronchial irritation may begin, but it does so as a complication, not as a symptom of the existing disorder, and under such circumstances may be more difficult to manage, but it is still a distinctive form of disease, and must be treated specially with the view to its removal. It is also a frequent concomitant of disease of the heart, and is very common in gouty subjects. As the disease progresses the patient becomes conscious of a tendency to warmth in the hands towards night, and he cannot take his usual exercise without feeling a shortness of breath. As winter approaches this cough becomes more frequent and decided in character, the expectoration is more copious, is thicker, and often presents a greenish hue; there is more feverishness, and he frequently perspires at night; at length he begins to lose flesh and strength. It is now spoken of as a "winter cough," and its periodical occurrence at this season may go on for some years. Its importance is thus apt to be disregarded, from the apparent subsidence of the attack during summer; but this is a fatal mistake, for each attack but adds to the local mischief which is going on, and at length those structural changes are produced which make the disease so formidable.

There are several forms of chronic bronchitis which derive

their names principally from the character of the expectoration, and the effect produced upon the breathing.

Moist Bronchitis is distinguished by the quantity and appearance of the matter expectorated. This may be copious, and is very apt to be so in old people; it may be watery, creamy, or slimy and tenacious. Paroxysms of coughing occur usually in the morning and evening; and during these fits of coughing the breathing is difficult and hurried, but this passes off when the lungs are freed from the accumulated secretion. This condition may last for some years, but the patient gradually wastes, the blood becomes impoverished, and death appears to result from the constant drain on the system kept up by the discharge from the lungs.

Dry Bronchitis is perhaps the most insidious form of this disease. The earlier symptoms are not marked by much severity. There may be simply short breathing when going upstairs, ascending an elevation, or attempting to run. When a considerable portion of one or both lungs is involved, there is a sense of oppression at the chest experienced after meals or on the slightest exertion. The difficulty of breathing becomes greater, and will continue for several hours, and even for some days at a time; this is at length relieved by a rasping cough and the bringing up of a glutinous and often a string-like expectoration, but usually this is very small in quantity.

The urgent symptoms just described as marking this form of the complaint, depend mainly upon two causes.

First, thickening of the membrane lining the tubes, by which their size is diminished, and consequently less than the proper quantity of air is admitted to the lungs. This thickening of the membrane takes place precisely as in the case of the air-passages of the nose already described, but of course the effect upon

the health is more severe, inasmuch as the importance of the organs implicated is much greater. As the result of this, nutrition of the body is impaired, because the blood is not sufficiently aerated, and, as I have elsewhere shown, becomes poisoned by retained impurities, and may give rise to the formation of tubercle.

Secondly, to the viscid and tenaceous nature of the secretion, which, accumulating in, and adhering to, the interior of the tubes, blocks up the smaller ones and prevents the free access of air to the cells of the lungs; hence the difficulty of breathing, and the still greater interference with the proper function of these organs, leading to the same result.

As in laryngitis there is sometimes formation of false membrane, so in bronchitis the secretion poured out will assume a similar character. In severe cases moulds of the tubes formed by this exudation are occasionally thrown off, and, as may be readily conceived, the amount of constitutional irritation produced is proportionably greater, and the danger to life is much increased.

Ulceration of the membrane, with the follicles and glands under it, may take place, and may even extend to the other coats of the tubes and surrounding textures, and excavations will be produced, which pour out a purulent discharge hardly distinguishable from that which is seen in the last stage of confirmed consumption.

As the ulceration commences and proceeds, the secretion assumes all the characters of matter; hectic fever is produced, night sweats ensue, and rapid wasting marks its progress to a fatal termination.

Dilatation or enlargement of the tubes may take place in portions, or in the whole, of one or both lungs. This dilatation

may be uniform throughout the length of a tube, or only in portions of it, and may be accompanied by spasm of the intervening portions giving rise to that peculiar and common form of disease known as bronchitic asthma.

It is unnecessary to extend my observations on this subject to prove the importance of this disease, not only from its serious nature, but as the forerunner or cause of others. It occurs as the most frequent complication of consumption, and adds greatly to the difficulty the physician encounters in the treatment of this disease.

There cannot be a doubt that when we see a person who for years has been suffering from frequently-recurring or continuous cough without free expectoration, and unaccompanied by a constitutional history or the physical signs which point clearly to tuberculous disease of the lungs, we are justified in regarding the affection as chronic bronchitis, which will run its course to a fatal termination, if not arrested by persevering treatment both local and general.

Treatment.—From all that precedes it will be evident that the treatment of this disease should be commenced with its earliest indications, and be directed principally to the arrest of that inflammatory condition upon which it depends.

To accomplish this we must inevitably attack the disease where it is situated. Our efforts must be directed to soothe and allay the inflamed state of the membrane, and this can be done by no means so effectually as by the application of such remedies as are known to possess this power over an inflammatory state of other tissues.

Warm and moist vapours charged with soothing and appropriate medicines are the means at our command. By their agency we can best promote that expectoration which will

cleanse the tubes, relieve spasm, and heal ulceration ; which will restore the healthy tone of the affected membrane, and, by promoting its proper function, remove the causes which give rise to the constitutional disturbance accompanying them, or which are likely to result from their continuance.

In the more aggravated stages of the disease its treatment will be essentially the same as that to be employed in consumption, and as the consideration of the means within our reach for this purpose has been fully entered upon under that head, it will be unnecessary to anticipate it here.

I wish, however, to refer to one point on which I am aware much misconception prevails. When told that they are suffering from bronchitis, ninety out of a hundred persons, even of those who are generally well informed, think that it is merely an affection of the throat which is implied, and this erroneous idea is apt to be confirmed by the fact, that in most instances the sensations of the sufferer are principally felt and referred to that region. But this is incorrect; the disease is seated within the lungs, and for its removal from thence the efforts of the physician must be directed, and he can only hope to succeed in the accomplishment of this object by administering his remedies in such a manner that they will penetrate the lungs and reach the seat of the disease.

PART II.



THE SYMPTOMS OF CONSUMPTION.

IN treating this portion of my subject, it is my desire to render it as simple a narrative as is consistent with the nature of the phenomena to be described. In order to do this I shall arrange my observations into three divisions, embracing "Threatened," "Incipient," and "Confirmed" Consumption. By this means it appears to me, that I shall be able to give such a description of the disease as will enable the reader to understand the connection of the several portions of my treatise, and to comprehend more clearly the principle of the system of treatment I recommend, and the advantages to be derived from its timely use.

THREATENED CONSUMPTION.

By this term I mean the presence of such a degree of constitutional disturbance as is generally understood when a person is said to be "out of health;" and when this is remarked in one who is the member of a family in which cases of consumption have already occurred, it is natural that the suspicion of an hereditary tendency should be aroused, and this ought to make watchfulness more constant for those other indications which point to the lungs as being weak, or the seat of irritation from any cause.

If this hereditary ground of apprehension is wanting, then the habits of life and occupation of the individual, which exercise so powerful an influence in the production of consumption, must be well considered; and when these are found to partake of this nature, the occurrence of any of those diseases which are known to precede and foster the development of tuberculous deposits should be carefully noted. I have fully considered these several points under the head of the "Causes of Consumption," and only refer to them here as among those tokens of approach which ought to put us on our guard, and make us more observant of other indications which point out the evil they may have produced.

Consumption is to be apprehended when, without any of the exciting causes just referred to, there is lassitude or disinclination to exertion of any kind, and particularly in young persons an indifference to those amusements which call for muscular activity. And this as frequently arises from a conscious inability to participate in them as from mere mental languor. The respiration is easily hurried; this increase in the frequency of breathing causes the heart's action to be accelerated, sometimes to a distressing degree, and is often attended by pain in the side. The complexion changes from the ruddy hue of natural health to paleness, and sometimes a sallow tinge is seen, more observable in those who may be suffering from defective action of the digestive organs, particularly of the liver. These latter derangements are so common as to be regarded by some as an exciting cause of the disease. In females there is an imperfect performance or total suppression of the natural periodical function. It is also observable in the young that while there is rapid growth of stature, there is a deficiency of muscular increase, and the tissues lose that firmness and elasticity

which usually mark this period of life. The temperature of the body is somewhat higher than that observed in a state of health and the skin is dry, while the feet and hands are cold, sometimes only to the sensations of the patient, but often to those of the observer.

If in addition to the existence of all, or most, of these indications there is a short, dry, hacking cough, probably first noticed on rising from bed in the morning, it should excite grave suspicion, and lead to the most careful examination of the chest. It may be unimportant in its character, for although cough is generally one of the earliest symptoms, yet it is sometimes absent until the latest stage of the disease.

INCIPIENT CONSUMPTION.

When the short dry cough, just referred to, becomes persistent—that is to say, in addition to its occurrence in the morning, it frequently recurs during the day, especially after slight exertion, and again at night—its significance cannot be overlooked with impunity. It is very apt to be disregarded and, as I have shown elsewhere, its presence is frequently overlooked or accounted for as arising from some cause different from any affection of the lungs.

After a time the cough is perceived to be attended by a clear mucous and somewhat thread-like expectoration, which, from the sensations accompanying its expulsion, is presumed by the patient to come from the throat. Now it is quite possible that these symptoms may result from that form of chronic bronchitis which has been previously described, but even if so, when regarded in connection with some of the other indications already referred to, it must always be considered as denoting the existence of a cause of irritation in the lung, differing from,

although it may be the result of, the bronchitis; and more especially if it should have come on gradually, without the pre-existence of the latter affection. After a time a change takes place in the character of the expectoration. The transparent mucus is observed to contain spots of a greyish-white matter of a thicker consistence, or to be of a green tinge, and at length to be marked by points or streaks of blood. The transparency of the mass of the expectoration gradually disappears, and becomes an opaque yellowish matter, which is much increased in quantity, is frequently difficult of ejection, and sometimes it is thrown off in lumpy masses. There is no uniformity in the quantity discharged; this may be very scanty, even where there is extensive disease, while the amount may be large from the commencement and increase until it is profuse in quantity, and in this case it is more easily got up.

Blood-spitting occurs in a large proportion of consumptive cases at some period of the disease. Although it is not always by itself to be regarded as a symptom, yet taken in connection with the history of the case, and the existence of other symptoms, it is of the highest importance. There is great difference with regard to the stage of the disease at which bleeding from the lungs may take place. Some persons will expectorate blood long before any of the other symptoms show themselves, and when they might otherwise be considered healthy; others do not spit blood until a very late period of the disease, and in a few instances consumption will run its entire course without a tinge of blood having been seen in the expectoration. It must be admitted, however, that the first attack of blood-spitting seems generally to date the commencement of the disease—the cough, the expectoration, and the hurried breathing being all referred and ascribed to its occurrence.

The quantity, the appearance, and the time of occurrence of this hæmorrhage are all points of interest and value to the physician in determining its significance as a symptom, and should be always unreservedly communicated to him by the patient. The quantity varies according to the source and cause of the bleeding, and may range from a scarcely perceptible spot or streak up to several ounces at a time. Sometimes the blood expectorated is of a bright red hue and quite fluid; at other times it is dark and clotted, and it may occasionally present a flesh-like appearance.

In the earliest stage of the disease, this bleeding is most frequently the result of congestion of the blood-vessels; oozing through the delicate coats of these vessels the blood is mingled with the secretion which is present in the cells and smaller tubes, and appears as spots or streaks, as already noticed, or like threads floating in the expectoration. Sometimes the whole of the expectoration is stained throughout of a bright pink colour. When the congestive state passes away, there is a sense of relief in the chest, and the breathing becomes easier. This may occur several times during the commencement of the softening of the tubercular mass, and the importance of this sign of the mischief which is going on ought not to be disregarded.

This form of hæmorrhage generally occurs before the disease is far advanced, and if prompt and effective measures are had recourse to in order to arrest its progress, the patient may be saved. But it is an error to suppose that because the bleeding ceases the disease is removed. It ought only to make us more careful to ascertain by examination the extent of the deposit which exists, and the changes which may have been produced by the means employed for its removal. Hæmorrhage from the

lungs may take place from other causes, such as injury to the chest or disease of the heart. It may also depend upon irregularity of the usual periodic excretion in females; but in these instances the exciting causes are readily recognised.

When a person spits blood, however, who has received no injury to the chest, in whom there is no evidence of heart disease, and in whom the monthly function is natural, there is every reason to apprehend that tubercles are present in the lungs. Baron Louis states that out of 1,200 cases he did not meet with an instance in which hæmorrhage was not preceded or followed by consumption.

Difficulty of breathing is a very early symptom of consumption, and as the disease advances it becomes more marked, not only by the number of inspirations in the minute being increased, but at each inspiration a less quantity of air is taken into the lung, and there is a feeling of uneasiness produced that gives rise to irregularity in the motions of the chest, which are often jerking and almost spasmodic. Sometimes, however, a case may run through its whole progress without the breathing being much affected until the last days of life.

In the state of health there is a remarkable connection observed between the beat of the pulse and the number of respirations per minute. This ratio is four beats of the pulse to each act of respiration. Any departure from this relation denotes disease, and in consumption we find that the pulse is quickened from a very early period. Each additional respiration above the standard of health is found to raise the pulse about five beats. The range of the pulse is observed to be from 100 to 140 beats per minute, according to the stage of the disease. Those cases in which the pulse is but little disturbed are to be regarded as more favourable for recovery.

When we perceive the co-existence of cough, expectoration, shortness of breathing, and blood-spitting, if the chest is carefully inspected, there will be found to be a partial change in its configuration, with a loss of mobility in a portion of one or both of its sides, according to the seat and extent of the deposit. When a marked difference is observed to exist between the two sides, in the position and movements of the ribs, the collar-bone, and the shoulder-blades, we are to a great extent guided in our opinion as to the seat of the internal obstruction which exists.

If we now apply either the ear directly, or the stethoscope, to the suspected region, certain peculiar alterations in the healthy respiratory sounds will be recognised. There may be an entire absence of the middle sound, already described as denoting the passage of air through the air-cells, or a peculiar crackling sound will be heard instead; while the sounds attending inspiration or expiration may be increased in duration, in intensity, or be otherwise changed. These phenomena, their variation and degree, guide the physician in determining the nature and extent of the obstruction. Percussion over the suspected region will give rise to peculiarities in, or reveal an absence of, the natural resonance, which taken in connection with the other evidences just enumerated, aid the physician materially in forming his opinion on the nature and stage of the disease. It is unnecessary to enlarge on these points, as they come more strictly within the province of professional study, and are familiar to all who give their attention to the careful investigation of lung disease.

Pain of some character generally attends the progress of consumption, but it depends rather on those complications which accompany the disease, and except in the last stage of the

complaint can scarcely be considered as a symptom. Generally there is a sense of weight or oppression. There may be sharp pains below the collar-bone, beneath the shoulder-blades, or in the sides. This pain is usually the attendant of pleurisy, but it may also arise from rheumatism or neuralgia. Its seat differs at various times, being frequently on the opposite side of the chest from that which contains the diseased lung.

Should the disease not be arrested in its advance, the constitutional disturbance increases. The warmth of the skin, which was noticed in the earliest stage, now takes the character of decided *fever*, which is always more apparent towards evening. It may be sometimes preceded by a chilly sensation, and is followed by sweating during sleep, but not invariably so. This succession of phenomena gives it a resemblance to "ague" or intermittent fever, and when this is the most prominent feature of the early progress of consumption, it is very apt to deceive the patient and friends as to its true nature. The hectic flush of the more advanced stage of the disease is a most characteristic sign, and has always attracted much attention. *Night sweating* is a very distressing symptom to the sufferer, who dreads the return of night for sleep brings with it this exhaustive and discomforting discharge.

There is a very close connection between the state of sleep and this peculiar sweating, for it is not only at night that it occurs; frequently if the patient dozes but for a few brief moments during the day, the brow will be covered with large drops. It is sometimes so profuse as to wet the clothing and bed-covering. *Wasting* is the peculiar mark of the disease, that from which it takes its name. It is often one of the earliest symptoms noticed by patients or their friends, but there must have been much interference with the function of the lungs

before it is so perceptible. It does not always keep pace with the severity of the disease, for there are acute cases which run their course to a fatal termination with comparatively little loss of flesh; but in chronic cases of long standing it is an invariable attendant on the progress of the malady, even though the appetite be good and the food nutritious and sufficient. In females there is a tendency to irregularity in the natural monthly function, and in many instances it is entirely suppressed at an early stage, and this occurrence is not unusually regarded as the cause of the disease; but this is an error.

The changes going on in the lungs depress the vitality of the whole system, and thus interfere with the due functional performance of all the organs. In this manner we can account for the deficient nutrition, the languid circulation, and many other symptoms which characterise the disease during its progress.

In the foregoing detailed description of symptoms, as marking the existence of incipient consumption, I do not wish to be understood that they are all necessarily present in this stage, or in every case, or are equal in degree of severity; but when several of them are noticed as existing together, and especially when those which are so observed occur in combination with the evidence derived from auscultation and percussion, we are warranted in pronouncing definitely on the nature of the disease, and in actively employing those remedial measures in the efficacy of which experience teaches us to place the greatest confidence. The earlier a physician is permitted to investigate a case and adapt his treatment to its requirements, the greater hope may he entertain of arresting the disease. Delay, at any stage of the complaint, is most reprehensible; while hesitation on the part of patients to avail themselves of the system of

treatment now recommended, simply on the ground of the failure of other methods heretofore employed, is most irrational.

CONFIRMED CONSUMPTION.

A patient is said to be in this condition when several or all of the symptoms previously described are present in an aggravated degree, and this division of my subject corresponds to that which is termed the *third stage* by most medical writers.

It is now that the cough becomes more continuous and harassing, its paroxysms extending into the hours of night and depriving the sufferer of rest. The expectoration gets thicker and more varied in appearance. Sometimes there is a mere frothy mass thrown off with a great effort, which not unfrequently ends in nausea and retching. At other times it is lumpy and easily dislodged, of a dark grey colour, and frequently presents points of pure yellow matter, or darker spots of a tough material. Examined by the microscope this expectoration exhibits all the indications of the destruction which is going on within the lung. It is a compound mass of mucus, pus, blood, broken-down tubercular matter, and fragments of the bronchial tubes and air-cells. It is the result of the softening process, and the ulceration of the tissues which follows this.

The hæmorrhage which now occasionally takes place is more copious, and arises chiefly from the wounding of some small blood-vessel by the ulceration which is invading all the tissues of the lung. When the size of the vessel thus cut through is large, the bleeding may be sudden, profuse and continuous, so as to fill up the lung and produce rapid death. This does not often occur, for nature generally provides against such a casualty by first blocking up the vessel which is assailed. The hectic fever now assumes a more intense character, and is more

continuous in duration, losing the intermittent form which it presented in the earlier stages, and the night-sweating becomes more profuse and exhausting. Wasting proceeds rapidly, the appetite is capricious, and the digestive functions are impaired to a great degree. Frequently there is obstinate constipation, but this may be attributed in some measure to the effects of the various opiates usually employed to allay the cough. More commonly there is diarrhœa, a very troublesome symptom occurring at any stage of the disease, and very often difficult to control. I have referred fully to this subject under the head of "Palliative Treatment."

Hæmorrhoids, commonly called "piles," are not an unfrequent accompaniment of the disease, but cannot be regarded in the light of a symptom; they form a complication which requires to be attended to carefully for the comfort of the invalid.

There is another complication of the latter stages of consumption which, however, must be looked upon as symptomatic of the nature of the disease. I refer to the formation of abscesses and fistulæ around the opening of the lower bowel. During the formation of the abscess there is great pain and much constitutional disturbance. If the abscess be opened externally early enough and properly treated, the formation of a fistula may be sometimes prevented. But the tendency to this troublesome affection is worthy of the careful consideration of all concerned in the care of the case.

Several other peculiarities are observable in patients suffering from consumption, and are regarded as distinctive indications of tuberculous disease. Thus a curved red line on the gums has been noted as early marking the existence of tubercle. A dark bluish-grey tint under the eyes is frequently conspicuous in persons with a fair transparent skin. These, however, are seen

in other forms of exhaustive maladies, and cannot be said to specially indicate consumption. The singular change which takes place in the shape of the nails is perhaps more characteristic, and is worthy of notice. The last joint of the fingers appears to enlarge, the nails acquire a peculiar curved and oval form, and present a slight purplish hue. This change may commence at a comparatively early stage of the disease, but is generally observable in the very last.

In the preceding enumeration of symptoms I have endeavoured, not to draw the portrait of an individual case, but to point out, as briefly as was consistent with clearness, those signs by which the disease may be recognised in any, or all, of its stages.

It will not be out of place here to offer a few observations on the question of the period of life at which the disease most frequently occurs; and this is a subject on which much misunderstanding exists in the public mind. The following analysis of the tables of Louis and Bayle given by Dr. Watson will show clearly the relative mortality at several ages, founded on the observation of 123 cases by Louis, and 100 cases by Bayle:—

Ages.				Louis.		Bayle.	
From 15 to 20	...	...	...	11	...	...	10
„ 20 to 30	...	...	...	39	...	...	23
„ 30 to 40	...	...	...	33	...	...	23
„ 40 to 50	...	...	...	23	...	...	21
„ 50 to 60	...	...	...	12	...	...	15
„ 60 to 70	...	...	...	5	...	...	8

From this table it appears that no age from fifteen to seventy is exempt; while the greatest mortality occurs between the ages of twenty and fifty. The calculations refer to persons after the age of puberty; before this period tuberculous disease is fear-

fully common, but manifests itself in a variety of forms, assailing several organs of the body besides the lungs.

According to Dr. Watson, "Among 920 children who died from the age of two to that of fifteen, no less than 538 were affected with tubercles."

Sir James Clark also says, on this point, "The mortality from these affections in infancy and childhood is much greater than is generally believed. Although we had long had occasion to remark the frequency of phthisis in childhood, we were not aware of the extensive prevalence of the disease at so early an age, until we examined the results obtained by the French pathologists, and we believe many of our readers will find themselves in the same position. The practical inferences to be deduced from these facts show the paramount importance of attending to the health of infants and children."

PART III.



THE NATURE OF CONSUMPTION.

ALL the symptoms, which I have thus detailed at some length, make up the disease called Consumption naturally so much dreaded by every one, not only from its great prevalence, but also from the fearful mortality which has hitherto marked its existence in this country, and has given to it the familiar title of the "English Scourge."

It will be necessary to consider on what these symptoms depend, and the morbid changes in the system which give rise to them.

Laennec, the discoverer of the stethoscope, in the course of his extensive pathological researches, found that small granular bodies always existed in the lungs in cases of genuine consumption. These bodies are called "Tubercles," and since his time the term Consumption has been restricted, and understood to apply to a disease of the lungs characterised by their presence.

The changes which these tubercles undergo regulate the stages of the disease. Thus consumption is said to be in the *first stage* when the tubercles are small specks of a greyish colour and semi-transparent. In this condition they resemble millet seed, and hence are called "*miliary tubercles*." They are usually scattered over a considerable portion of the upper part of one or both lungs immediately beneath the collar-bone, more

frequently perhaps on the left side of the chest. They are found in the texture of the smaller air-tubes, in the air-cells, and on the free surface of the mucous membrane lining them.

In the *second stage* of consumption, as the disease advances, these little specks steadily increase in size, accumulate in number, and become packed together; then change to a yellowish colour, and when pressed between the fingers, in examinations after death, they break down and present the appearance of decayed cheese. Having reached this stage the tubercles may remain for weeks, months, or even years without undergoing further change or giving much warning of their presence, except by causing an increased difficulty of breathing on any unusual exertion. There may be also a slight cough and mucous expectoration arising from the irritation they produce.

The *third and last stage* of consumption is caused by these cheesy tubercles becoming softened down into matter, and by their producing ulceration of the substance of the lungs; during this process of ulceration, when prolonged, the vital powers of the patient are exhausted, and the system sinks under the disease.

This tuberculous matter becoming mixed also with that which is formed by the destruction of the tissues of the lungs, makes up the expectoration which is so marked a symptom of this stage of the disease. This matter finds its way into the larger air-tubes and is coughed up and expectorated, leaving a cavity or excavation, from which fresh matter is continually being discharged. These cavities may vary in size from a pea to a space sufficient to hold several ounces of fluid.

This is the ordinary course observed in cases which terminate fatally; but the tuberculous deposit may be otherwise removed,

or undergo such a transformation as neutralises its destructive tendency.

Thus it may be altogether absorbed, either by strong vital action of the natural functions, or as the result of timely and appropriate medication, a point to which I shall again revert when I come to consider the treatment of the early stage of the disease.

The natural tendency is unquestionably to get rid of the deposit by absorption, or to effect such a change in its character as will render it harmless to the tissues in which it is thrown down ; this is found to be the case in a certain proportion of instances, and two alterations have been recognised—one into an earthy substance, which will sometimes be expectorated, or it may remain in the lung for years without producing any structural change in the surrounding tissues ; the other appears like a tough material resembling gristle, and this also will remain unchanged. These processes may be regarded as the natural cure of the disease, and are by no means so unfrequent as is generally supposed. Another process of cure consists in the shrinking of the cavities formed by the breaking down and expulsion of the tuberculous masses, and healing of the ulceration of tissue which accompanies this stage of the disease. At this period it is that the powerful agency of properly adapted local remedies becomes all-important. Few who have not witnessed the effect of the action of medicinal vapours on the lung structure can realise the benefit derivable from their use, even in those cases where palliation alone can reasonably be anticipated.

Before proceeding to consider how these tubercles are formed, it will be necessary to say a few words on the subject of respiration. This function, or, as it is popularly termed, the

“act of breathing,” is one of the most important of the body, for any hindrance to its perfect performance interferes seriously with all the other vital processes, and its arrest, even for a very short period, is destructive to life itself.

The great and only purpose of this function of respiration consists in the mutual interchange of certain elements contained in the atmospheric air and in the blood, and this interchange takes place in the lungs.

It is well known that atmospheric air consists of a combination of two gases, oxygen and nitrogen, mixed together in certain definite proportions, which vary according to the method of computation employed. Thus, by *measure*, the proportions are, oxygen 21, nitrogen 79, in every hundred volumes; whilst by *weight* the proportions are, oxygen 23, and nitrogen 77, in every hundred parts. It is by the action of the oxygen that vitality is sustained in all organised beings which breathe, and this action is exerted through the medium of the blood.

The philosophy of respiration may be thus briefly explained :—

The impure venous blood, and the chyle produced by the digestion of food, are mixed together and sent to the lungs, and distributed over more than one hundred millions of little air-cells, in minute capillary vessels (called capillaries from their hair-like fineness) which form a perfect network over the inner surface of each cell. When these cells are inflated with air, as is the case whenever we “draw in a full breath,” the blood and the air are separated from each other only by a thin membrane, so delicate in texture that it allows the oxygen of the air and the impure gases of the blood to pass through it freely. This is, indeed, the special vital property of this membrane. A portion of the oxygen is received into the blood, changing its character from venous to arterial, which

change is accompanied by a marked alteration of colour from a dark purple to a bright red. The remainder of the oxygen combines with carbonaceous compounds of the blood to form carbonic acid gas, which is cast out in the act of respiration.

This exchange is a process of chemical combination, and can take place only in definite proportions—that is to say, a certain definite quantity of oxygen is required to displace a certain definite quantity of carbon.

Numerous attempts have been made by physiologists to determine by experiment how much oxygen is consumed, and how much carbonic acid is given off, during this process of respiration.

The researches of Mr. Hutchinson have placed within our knowledge certain data of calculation with regard to the oxygen. From these we may reasonably assume that a healthy male adult, whose heart beats 80 times in a minute, makes 20 respirations during the same period, and that at each inspiration he takes into his lungs 20 cubic inches of air; so that in 24 hours he would make 28,800 respirations, and inspire 576,000 cubic inches of air. This would be equal to about 35 ounces of oxygen.

On the other hand, the estimates of the quantity of carbonic acid exhaled from the lungs, made by several experimentalists, differ considerably. Thus Lavoisier and Seguin place it at 14,930 cubic inches in 24 hours; Sir Humphrey Davy at 31,680 cubic inches; and Allen and Pepys at 39,600. This latter quantity would be equivalent to nearly 11 ounces of solid carbon. Andral and Gavarret calculated the amount of carbon at 9 ounces. Mr. Coathupe reduces it to 5 ounces, and Liebig asserts that the total quantity excreted from the lungs and skin together amounts to nearly 14 ounces. This removal of carbon

by the process of respiration is found to be influenced remarkably by external circumstances, and this is probably the reason of such great differences in the results arrived at by different experimentalists. Thus, when the weather is cold, the amount exhaled is greater than when it is warm. It is increased during exercise and after eating, whilst it is diminished during sleep. The maximum amount would appear to be given off at noonday, and the minimum at midnight. It is also worthy of note that hunger, sedentary occupation, fermented liquors, and vegetable diet diminish the quantity exhaled; whilst mental tranquillity, moderate exercise, and a generous diet, increase the quantity. These facts become important, as pointing out the necessity of a due regulation of the diet and habits of life as component parts of the curative treatment, in all diseases of the respiratory organs.

So long as the proper changes take place between the oxygen of the air and the carbon of the blood, the full proportion of the blood is purified, the chyle vitalised and fitted for nourishment, and neither scrofula nor tubercles can find a habitation in the lungs.

But if the supply of pure air be diminished, the whole of the carbon cannot be removed, and, as a necessary consequence, a part of it continues to circulate through the system, vitiating the blood, and deranging the action of the whole machinery of life. The brain, the nervous system, the stomach, and all the other important organs of the body feel the shock, and manifest sympathy with the lungs. And not only is the carbon not fully expelled, but the chyle is not properly vitalised, and, as a consequence, the body is badly nourished, and emaciation follows and keeps pace with the progress of the disease. These two influences—viz., the vitiation of the blood by an excess of

retained carbon, and its circulation through the several organs and tissues of the body, and the defective nutrition caused by the imperfection of the chyle—soon produce that peculiar condition of the system which is understood by the term “scrofulous,” and of which the deposit of tubercles in different organs of the body is the inevitable consequence.

The truth of this explanation of the causes which induce consumption derives further support from the localisation of the tubercles themselves. If this doctrine be correct we should expect to find that organ, in which the blood is first obstructed and rendered impure, the first to suffer injury therefrom. And this is almost invariably the case. “We never find,” says Louis, “tubercles in any other organ without their presence in the lungs.” And Carswell observes that “the lungs, in respect of the extent and frequency of the tubercular deposit, hold the highest rank.”

And so, also, if the tubercles be derived from the blood, should we expect to find that this fluid would soon transmit them to other organs; and this, too, we know to be the case.

They are first deposited in the lungs, and subsequently in other tissues, until in the last stage of consumption there is scarcely an organ of the body that is not more or less loaded with them.

Medical men differ very considerably as to the composition of these tubercles, and also as to the mode of their formation; indeed, it may be truly affirmed that on few points of disputed opinion does there exist so great a contrariety of views as on the true nature of tubercular disease. All agree that this peculiar matter is a deposit from the blood, but what that condition of the blood is in which it originates, continues to be a disputed point.

The most rational theory as to the production of this tuber-

culous deposit appears to me to be as follows:—Tubercles are the result of defective oxygenation of the blood; they are produced by any cause that tends to impair the function of respiration, either by diminishing the purity of the air or the freedom of its admission into the lungs. They are, in fact, the carbonaceous impurities of the blood slowly deposited in the lungs and other textures of the body, by reason of the requisite interchange between the oxygen of the air and the impurities of the blood, already referred to, not being properly performed during the process of respiration.

This view of the carbonaceous nature of tubercle is fully borne out by other authorities. Thus, Dr. Henry MacCormac says—"Tuberculous deposits, then, whether in the offspring of scrofulous, consumptive parents, or others, are the invariable results of insufficient, imperfect respiratory function. Hence the carbon is retained unoxydised, in other words, is not discharged or sufficiently discharged from the blood, and, finding no adequate outlet, being neither burnt off in the lungs or expended in the tissues, is deposited, mainly as a hydro-carbon, in the lungs and other organs, under the form of the body known by the designation of tubercle."

Dr. Marcet* also, after explaining his views as to the manner in which the interchange between the carbonic acid of the blood and the oxygen of the air is effected, remarks—"In this state of health, the exit of carbonic acid from the body is thus perfectly regulated; but should any of these conditions for the normal elimination of this gas be deficient or in any way altered, as from some disease of the tissue of the lungs, or from the temperature of the body being depressed, or from the volume of

* *The Lancet*, February 2nd, 1867.

air inspired being too small, then carbonic acid will be retained and accumulate in the blood, adding to the existing disease." And he adds—"A thickening or other morbid state of the lungs, by interfering with the absorption and diffusion of oxygen throughout the tissue, will, it may reasonably be expected, add to the constitutional disorder by impeding the admission of oxygen into the blood; it is important to bear in mind this circumstance for the rational treatment of this class of diseases."

Dr. Dawson, of Brighton, in a paper communicated to the Royal Medico-Chirurgical Society, and reported in the *Lancet* for April 20th, 1867, describes the mechanism of tubercle formation to be that, "from an unseen cause, certain cells in a tissue take upon themselves diseased action of the nature of nuclear hypertrophy; that this action continuing in many cells at once, as in the lung sac, the passage becomes choked, its function destroyed, and hence arose a tubercle."

Now, even admitting this view to be correct, I think we can account for this assumed "nuclear hypertrophy" (or morbid increase in size) by the deposit within its texture of the carbonaceous impurities of the blood, or what Dr. Williams calls the "degraded plastic material of the body." In commenting on this communication the latter eminent physician says—"Wherever the nutrition of the body is degraded by bad food, damp or impure air, insufficient exercise and clothing, and other deteriorating influences, there would tubercle, to a greater or less extent, be developed."

In addition to this important testimony, organic chemistry furnishes still more explicit evidence in proof of the correctness of my views as to the composition of the tuberculous deposit.

Analysis shows that in tubercle carbon exists in greater excess than in any texture of the body.

The German chemist Scherer, in his analysis, found the following to be the composition of tubercle when entirely separated from all adhering fat—

Carbon	53·888
Hydrogen	7·112
Nitrogen	17·234
Oxygen	21·766

100·000

Dr. Glover also found carbon to be in the following proportions in an elementary analysis of three different specimens of tubercular matter:—

	1st.		2nd.		3rd.
Carbon . . .	54·97	...	56·40	...	53·43

According to Louis,* 100 parts of solid tubercle will be found to contain 98 parts of animal or carbonaceous matters, traces of chloride of sodium and oxide of iron; while carbonate and phosphate of lime in about equal proportions make up the residue.

Müller gives us the following elementary analysis with regard to the quantity of carbon contained in other animal tissues on the authority of the following distinguished physiologists:—
Thus—

According to Sass and Pfaff:—

Muscle contains of Carbon . . . 48·30 per cent.

According to Michaelis:—

Fibrine contains of Carbon . . . 51·347 „

Arterial Blood contains of Carbon . 51·382 „

Venous Blood contains of Carbon . 53·231 „

* Louis. Art. Phthisie, *Dictionnaire de Médecine*.

According to Gay-Lussac and Thenard:—

Albumen (coagulated) contains of

Carbon 52.883 per cent.

Now from these analyses, extracted from the most reliable sources at my command, it would appear that tuberculous matter contains a greater percentage of carbon than any component of the body.

It is not necessary to my argument to determine the exact excess of this element, although from the foregoing statements of analysts it will be seen that tubercle contains at least one per cent. more carbon than impure venous blood, the most carbonaceous of the vitalised products. And in the chemistry of all substances, it is a well-recognised principle that not only an apparently trifling difference of the component elements alters completely their characters and properties, but that some peculiar modification of the force by which the component elements are arranged and held together in combination produces the same result. This is well seen in the mutual conversion of substances whose chemical composition is analogous, such as sugar, starch, and alcohol,* which are convertible one into the other by disturbance of the relation existing between their elements.

These are strong facts that cannot be denied, and fully justify the theory just expounded, and show it to be quite consistent with the phenomena presented by the disease. "How simple, natural, and intelligible," says a recent writer, "are the views here advocated as contrasted with some others untenable in themselves, and leaving the source of phthisis exactly where they found it."

* According to Professor Brande, the following is the composition of starch and sugar:—

Starch, $C^4 H^3 O^3$.
Sugar, $C^3 H^3 O^3$.

PART IV.



THE CAUSES OF CONSUMPTION.

I NOW come to the consideration of the causes which produce this tubercular condition, for it is only by tracing a disease to its very source that we can ever hope to devise any proper means for its prevention, or establish a rational mode of treatment for its cure.

The importance of this part of the subject cannot be too highly estimated; I shall, therefore, endeavour to give a clear explanation of each cause, and the mode in which it tends to produce the disease.

The causes, then, that produce consumption may be primarily arranged under two heads—viz., those which are *hereditary*, and those by which it is *acquired*.

Hereditary Predisposition.—The fact of inheritance, or the transmission of this disease from parents to their offspring, cannot for one moment be doubted, but much more stress is generally laid upon this cause, in my opinion, than it would seem to merit. It is a popular and generally-received opinion that hereditary transmission is the most common cause of consumption; and hence arises, not only a disinclination to admit even a suspicion of its existence, but also that neglect of the premonitory symptoms by invalids and their friends, so much to be regretted, because they fail to trace the occurrence of the disease

amongst the members of their families. They disregard the hacking cough, shortness of breathing, loss of flesh, and gradually increasing debility, until the disease has taken a firm hold upon the system, and the lungs have commenced to suffer from destruction by ulceration; and they are probably first aroused to a consciousness of their perilous condition by an attack of blood-spitting.

Now the statistics of consumption teach us that out of every 100 cases of the disease 80 acquire it from the operation of the causes hereinafter described, while in only 20 cases can it be clearly traced in any direct or collateral branches of their families.

Dr. Walshe places the acquired cases at 79 per cent., and those arising from family inheritance at 21 per cent.

Dr. Cotton in his work on consumption says, that in somewhat less than two-thirds of the cases that came under his notice, the disease could not be shown to have proceeded from the hereditary cause.

Briquet, physician to one of the Paris hospitals, tells us that out of 98 cases occurring under his observation, 68 were unable to discover any family predisposition.

It is unnecessary to multiply authorities on this subject, but I feel justified, from a very careful examination of the statistics we possess, in stating that an hereditary tendency to the disease cannot be fairly established in a greater proportion than one in five of those who suffer from it. Nor are we enabled, from this source of information, to arrive at a very definite conclusion on the point as to whether the transmission of the disease is the most frequent through the paternal or maternal channel.

There is one aspect of the question, however, which must not be overlooked; and it is this—that whether the germs of the

disease be actually and directly transmitted from the parents to their children, the offspring of consumptive parents are born with either such an amount of defective organisation or such depreciated vitality, as renders them more susceptible to the influence of those causes which are known to produce the disease. Thus, a small, badly - formed chest or an irritable mucous membrane may exist from birth, inherited from parents, and either of these is acknowledged to be a cause which strongly predisposes to the development of tubercles, the former by preventing the proper expansion of the lung structure, and consequently diminishing that volume of air which is essential to the perfect function of respiration; the latter by increasing the liability to catarrh, bronchitis, or other forms of congestive action, which equally impede the function, and promote those morbid changes which terminate in tuberculous deposit in the lung.

Children born with this defective organisation generally die during infancy of some tubercular disease, either of the glands of the bowels (mesenteric disease), the brain, or the lungs. If they pass safely through this period they are always very delicate in youth; they are not able to undergo fatigue to the same extent as other children of their age. They may, however, still pass the age of puberty without showing the least sign of consumption, but they will certainly always exhibit a greater susceptibility to the action of those external causes which operate in producing the disease, than those who are the offspring of healthy parents.

There is a tendency in modern education to overtask the mind of children, instead of allowing them the freedom and enjoyment necessary for healthy development of the system.

If parents would but pay proper attention to the physical

training of their children, and employ judicious means to increase the capacity of the lungs by exercise, the free use of pure air, and a sufficiency of wholesome food, this susceptibility would be very greatly diminished, if not entirely overcome. Develop the lungs of a consumptive offspring, and it will grow up as vigorous as though no taint of pulmonary disease had ever been found in any member of its family.

The causes of Acquired Consumption may be arranged under the following heads:—

1. *Certain Diseases of the Throat and Air-Passages, as Catarrh, Granular Disease of the Throat, Elongated Uvula, Enlarged Tonsils, Laryngitis, Bronchitis, &c., all of which diseases are the direct consequences of neglected colds.*

A considerable difference of opinion exists among medical men as to the extent to which the above diseases can be fairly regarded as causes of pulmonary consumption; but those physicians who have had the greatest amount of experience in chest complaints, all agree that their prolonged continuance acts most injuriously, and becomes a sufficient cause of tubercular deposit.

Dr. Cotton says—"The frequency with which consumptives attribute the commencement of the disease to 'an attack of influenza' or 'a severe cold,' at once points to the influence of these disorders in the development of tubercle."

And again—"Catarrh, also, when severe, and accompanied with constitutional disturbance and bronchial irritation, appears in many instances to bring into activity phthisis hitherto dormant."

Professor Swett also observes—"Chronic laryngitis is, in a

great majority of cases, a condition of the scrofulous diathesis. In most instances it is associated with manifest and advanced tuberculous disease of the lungs."

And Ancell tells us that "Bronchitis is regarded by a great number of authors as a cause of consumption. Hufeland, Tissott, Baumes, Broussais, and I believe all the disciples of his school, and many practitioners in this country, have expressed a similar opinion."

I believe that all the diseases which I have named above exert a very powerful influence in producing the rapid development of tubercular deposit, by causing an inflammatory thickening of the mucous membrane, and the further obstruction of the air-tubes by the secretion of a viscid mucus, which is always abundantly poured out when these diseases become chronic.

It makes no real difference from what part of the air-passages this viscid secretion is produced, whether it comes from the larynx, from the trachea, or from the bronchial tubes. The effect in each case will be the same.

This mechanical obstruction necessarily diminishes the quantity of air taken in during inspiration, for if the calibre of the windpipe or one of the larger bronchial tubes becomes diminished to one-third or one-half its usual size, the quantity of air drawn through it is diminished to one-third or one-half the required amount, and the blood cannot, therefore, receive a due supply of oxygen, or expel the proper proportion of carbon and its compounds. The same result ensues when the smaller bronchial tubes are partially or completely obstructed by retained and adherent secretion; the air does not obtain access to the cells of the lobules to which these tubes are the channels of entrance, and thus their natural function is impeded, and they more readily become the seat of tubercular deposition.

I have dwelt more upon this particular point, as I regard this condition of the breathing apparatus to be the most general exciting cause of the disease in active operation in this country. The sudden changes of temperature to which we are all liable in this variable climate, combined with insufficient and unwholesome food, ill-ventilated apartments, want of cleanliness, and constant exposure to wet, are undoubtedly the most fruitful source of the disease among the poorer classes. The same causes operate also upon the wealthy, and those who enjoy the constant watchfulness and care of relatives and friends, but in this case the conventional mode of life adopted by the higher classes of society and those who imitate them, combined with light dressing, thin boots, late hours, crowded assemblies, and mental excitement, all contribute to the same end.

Though in these instances the injury may not be such as to immediately endanger life, it is always sufficient to undermine the strength and tone of the system. When little particles of phlegm and viscid mucus obstruct the air-tubes through which the air has to pass, the blood is not, and cannot be, thoroughly purified, and if it is not so purified, we have sooner or later the formation of tubercle, and consumption produced.

2. *All Trades and Occupations in which the necessary position of the body cramps the chest, restrains its movements, and thus prevents the proper expansion of the lungs, by interfering with sufficient respiration.*

This influence of pursuit and occupation is universally admitted by physicians to be one of the direct causes capable of setting up tubercular disease. The chest may be, and probably is, in all these cases well formed and of proper capacity, but the habitually constrained position of the body diminishes it, and

restrains that expansion of the lungs essential to health, and by its continuance ultimately distorts the form of the chest to such a degree as to produce a permanent physical obstruction to free respiration. As a natural consequence, the chest-motion is impeded, the quantity of air taken in at each inspiration is too small to purify the blood thoroughly, and from this cause the carbonaceous impurities accumulate, and tubercles are deposited with greater or less rapidity. From this cause clerks, book-keepers, watchmakers, shoemakers, tailors, weavers, dressmakers, and curriers are all very prone to consumption.

Dr. Edward Smith, of the Brompton Hospital, says—"The association of shallowness and feebleness of respiration is seen in the most marked degree in tailors and shoemakers, clerks, and others who follow very sedentary occupations, and sit with the chest bent forward. In such persons the act of respiration is at all times defective, and they are known to be very prone to the occurrence of consumption."

Another very common cause is to be found among females in the habit of tight-lacing, which restrains the proper motions of the chest, and prevents the necessary expansion of the lungs.

Dr. Johnson remarks on this point—"In fashionable female attire the abdomen is so compressed by stays that the diaphragm can only partially descend, while the whole of the middle and lower part of the chest is so firmly girt by the same cincture, that the ribs are kept motionless. Respiration is carried on by an excessive action of the muscles, and extraordinary elevation of the ribs in the upper part of the chest, where it is free from pressure."

To this I may add, that the increased amount of function thus forced upon the upper portion of the female lung must materially increase the irritability or sensitiveness of the mucous

lining of the air-tubes, and render it more prone to take on a congestive action from the operation of the usual exciting causes of bronchitis.

3. *Impure air, deficiency of out-door exercise, and prolonged confinement in close, badly-ventilated rooms.*

This is one of the most constant and powerful causes of consumption. It operates by lowering the quality of the air to be respired—that is, by depriving it of its oxygen, and substituting in its place the noxious product of respiration, carbonic acid.

I have shown, in a previous part of this treatise, that the air after passing through the lungs is deprived of a considerable portion of its oxygen, and becomes loaded with carbonaceous impurities. Now, if one per cent. of carbonic acid exists in a room, the air becomes unfit for healthy respiration. Two per cent. will kill a singing-bird, and five or six per cent. is speedily fatal to human life. It therefore follows that if the air be contaminated with but a very small proportion of the noxious ingredient produced by respiration, the proper purification of the blood cannot take place, and the function of the lungs is in a proportionate degree impeded. The purity of this air depends entirely on its free circulation and frequent renewal, and if this does not take place the enervating effect of the blood-poisoning will soon be felt by persons respiring such an atmosphere. This is particularly noticeable in counting-houses, workshops, theatres, and places of public assembly. In many of these places the air is rendered so impure by being constantly re-respired, that headache, giddiness, languor, nausea, and fainting are produced by even a short stay in such an atmosphere, and a prolonged exposure is certain to produce well-marked symptoms of consumption. Thus it is that tailors, dressmakers, printers,

and others, whose occupation is usually carried on in badly-ventilated apartments, are particularly liable to this disease; while, on the other hand, butchers, carters, and drovers, whose pursuits take them into the open air, are comparatively exempt.

Dr. Williams, in his work on the *Principles of Medicine*, says—"The habitual want of pure air especially exerts an unfavourable influence on the state of the blood, and on the functions of circulation and respiration, causing pallidity of the surface and imperfect development of the corpuscles and plasma, which then, instead of contributing to the nourishment of the textures, degenerate into scrofulous or tuberculous matter, whose deposition in the internal organs or glands is further favoured by the weakness of the circulation."

Dr. Parkes*, in writing on the prevalence of consumption in the continental armies, says—"In all these armies the same causes are in action, and the predominance of the disease is mainly to be sought for in the impure barrack air."

M. Baudeloque, a writer of great repute and authority in France, also believed a vitiated atmosphere to be the chief, if not the sole cause in the production of tubercles. He says—"Wherever scrofula exists a vitiated atmosphere also exists; wherever there is a vitiated atmosphere there is also scrofula; wherever the air is pure this disease is unknown."

Of the influence of sedentary confinement in producing tubercles we have the following remarkable illustration from Laennec, the greatest modern authority on this disease:—"I had, during a period of ten years, a striking example of the effect of the depressing passions in producing phthisis in the case of a religious association of women of recent foundation,

* *Practical Hygiene*, p. 492.

and which never obtained from the ecclesiastical authorities any other than a provisional toleration, on account of the extreme severity of its rules. The diet of these persons was certainly very austere, yet it was by no means beyond what nature could bear. But the ascetic spirit which regulated their minds was such as to give rise to consequences no less serious than surprising. Not only was the attention of these women habitually fixed on the most terrible truths of religion, but it was the constant practice to try them by every kind of contrariety and opposition in order to bring them as soon as possible to an active renouncement of their own proper will. The consequences of this discipline were the same in all; after being one or two months in the establishment the catamenia became suppressed, and in the course of one or two months thereafter phthisis declared itself. As no vow was taken in this society, I endeavoured to prevail upon the patients to leave the house as soon as the consumptive symptoms began to appear, and almost all who followed my advice were cured, although some of them exhibited well-marked indications of the disease. During the ten years that I was physician to this association I witnessed its entire renovation two or three different times, owing to the successive loss of its members, with the exception of a small number, consisting chiefly of the Superior, the gate-keeper, and the sisters who had charge of the garden, kitchen, and infirmary. It will be observed that these individuals were those who had the most constant distraction from their religious tasks, and that they also went pretty often into the city on business connected with the establishment."

It will be seen that Laennec attributes the development of the disease entirely to the influence of the "depressing passions" called into play by the ascetic spirit of the religious observances.

But I think that another and more probable explanation can be given. It is not likely that there was any difference either in the amount of the religious observances of the inmates of this establishment, or in the kind of diet permitted. The only particular in which there was an important difference appears to have been that of *pure air* and *exercise*. The "Superior, the gatekeeper, and the sisters who had charge of the garden, kitchen, and infirmary," went freely into the open air, while the others were confined to the house. These escaped consumption during the whole ten years, while the sisters confined to the house all died off, and were renewed several times during the same period. And, what is still more corroborative of this view, that the difference, between perfect health on the one hand and consumption on the other, depended upon the air alone, is the fact admitted by Laennec, that almost all those whom he was able to "prevail upon to leave the house were cured," while those who remained, though under his professional care, all died.

I think no argument could possibly be stronger than that derived from the foregoing facts, in proof of the influence of insufficient exercise and confinement in unrenewed air in producing the development of tubercles.

Again, it is a well-known fact that cows, when shut up in close, badly-ventilated stalls, all become consumptive. They are placed under the very circumstances most likely to produce the disease. Exercise, in many instances, is wholly denied them, whilst the very impure state of the atmosphere and food in a state of fermentation and semi-decomposition all contribute to lower the vital power and to foster the development of tubercles. The impure milk given off from these animals becomes almost the sole nourishment of delicate children and invalids, and

must be a very fertile source of vital depreciation, if not of positive inoculation.

Tubercles and tuberculous cavities are found in the lungs of all caged animals after death. The confined air in which they are necessarily kept engenders consumption, notwithstanding they are fed on the best of food, and the utmost care bestowed upon them. Thus, animals confined in zoological gardens, especially monkeys, are particularly liable to consumption. Mr. Owens, the assistant-curator of the Museum of the Royal College of Surgeons, found tubercles and tuberculous ulcerations in the lungs of most of the animals which died in the gardens of the Zoological Society, and I have myself had many opportunities of inspecting the lungs of animals that have died in zoological collections, and of verifying the truth of his observations.

I observe that Dr Crisp, in a paper read before the general session of the St. Andrew's Medical Graduates' Association, states that he has met "with many instances in the inferior animals showing the hereditary nature of tubercle." It is questionable, however, whether his experience is founded on the observation of these animals in a state of nature, but rather in a transplanted condition, by which their habits and diet are altered, and they are subjected to those very influences which he himself admits to be the most frequent cause of the disease. He says:—

"Tubercular deposit may be produced in man and in the lower animals (mammals, birds, and reptiles), by a vitiated atmosphere, bad diet, a change of temperature, and other unnatural conditions."

Dr. Carswell, the late professor of pathological anatomy in the London University, found that he could readily produce

tubercles in rabbits and other animals by simply confining them in impure air.

We have no reason to believe that animals ever inherit consumption. Tubercles are never found in their lungs when running at large, whether domesticated or in a state of nature, and yet if we can produce this disease in any animal by exposing it to certain influences which shut it off from a proper supply of pure air to the lungs, such influences must be regarded as the real causes of its development.

4. *All Trades and Occupations which expose the lungs to direct irritation.*

It has been long noticed that the inhalation of air charged with irritating substances in a state of minute subdivision, as occurs amongst stone-cutters, glass-cutters, needle-grinders, millers, and flax-dressers, is a very frequent cause of consumption.

Dr. Allison, of Edinburgh, tells us that there is hardly an instance of a mason regularly engaged in cutting stones in that city free from consumption at the age of fifty years. Exposed to the inhalation of fine particles of sand, dust, and powdered stone, they generally die before they reach the age of forty. An immense proportion of the miners of Cornwall are destroyed at an early age by chronic bronchitis and consumption. The quarrymen at St. Roch, in France, are so liable to consumption that among them the disease is known by the name of "la maladie de St. Roch."

Chateauneuf also tells us that the mortality from consumption has frightfully increased among the people of the commune of Meusnes since they engaged in the manufacture of gun-flints.

Thackrah, speaking of the injurious effects produced by the

dust of mills, says—"In proportion to the degree and continuance of this deleterious influence is the head affected, the appetite reduced, respiration impaired, cough, and finally bronchitis or tubercular consumption produced."

There are few persons who have not read the accounts of the injurious effects produced amongst workmen by *dry-filing* and *dry-grinding*. Those engaged in this kind of work are all short-lived. They acquire a tubercular condition of the lungs rapidly passing into ulceration, which amongst them has acquired the epithet of "the grinder's rot." Sir James Clarke assures us that, in two principal machine factories at Leeds, there were to be found only two 'dry-filers' who had reached the age of forty-eight years. The experience amongst grinders is still worse.

Dr. Knight found "about 2,500 grinders in Sheffield. Of these 80 men and 70 boys are 'fork grinders'; they grind *dry*, and generally die at from 28 to 32 years of age. The 'razor grinders' grind both *wet* and *dry*, and they die from 40 to 45 years. The 'table-knife grinders' work on *wet stones*, and they live to between 45 and 50 years."

To prove that "grinding" is more injurious than other trades, he made a comparison of all the workmen, and found that of 250 grinders, no less than 150 laboured under disease of the lungs, while of the same number engaged in other work only 56 were consumptive.

Although the actual result from this cause be the same, namely, tubercular deposit and destruction of lung tissue consequent upon the changes which tubercle undergoes, the mode in which this result is produced differs from that in which it is brought about by either of the preceding causes. In those we have, first, a diminution in the requisite quantity of the air, and

secondly an impoverished or poisonous quality of the air which is respired. Here we have the contact of hard particles with the delicate membrane lining the tubes and air-cells, causing a direct mechanical irritation, and producing such an alteration in the condition of the minute blood-vessels, which are so abundantly distributed in this membrane, as by long continuance impairs their proper function—that is, the due interchange of the oxygen of the air and the carbonaceous impurities of the blood. Accumulation of these particles in the cells and more minute tubes also takes place, blocking them up, and thus also impeding complete respiration. This is well seen in those who are exposed to the respiration of dense smoke or coal-dust, in whom the expectoration is observed to be charged with black spots; and the “black lung” of miners is well known to medical men.

The use of some means of preventing the respiration of these irritating particles, such as respirators or screens, has been, in some instances, had recourse to with very great advantage, diminishing to a marked extent the occurrence of the disease from this source, and they should be universally adopted by those whose occupations expose them to the respiration of a dusty atmosphere.

From a careful perusal of the foregoing statements, it will be seen that all these various causes meet at a common point—namely, an impairment of the function of respiration and prevention of the perfect decarbonization of the blood. The most common seat of consumption, especially in the adult, is in the lungs, and all the causes capable of producing the disease act by obstructing the respiration. It is the function of the lungs that is primarily defective, and whatever other derangements exist throughout the system, in common with pulmonary disease, are

accidental or sympathetic in their connection with it, and not causes of the disease.

Ancell, in his work on Tuberculosis, observes—"The most efficient of the true causes, or those influences which are most powerful in inducing the disease (consumption), are a vitiated atmosphere, insufficient muscular exercise, and the depressing passions. The whole of these meet, as it were, at one common point, and have probably one essential *modus operandi*—viz., an insufficient renewal of pure atmospheric air, or an altered condition of the air habitually contained within the chest."

If, therefore, the motions of the chest are restrained by posture, or by any cause which habitually prevents its proper expansion, or if the size of the air-tubes be diminished by a thickening of their lining membrane, or by obstructing mucus, the lungs cannot be properly filled with air.

If the air be impure, though the lungs be ever so well filled, it does not exert the full effect upon the blood which is absolutely necessary to health.

If the air be loaded with dust or any foreign matter, the mechanical irritation caused by this produces an altered condition of the minute blood-vessels distributed to the air-cells, and prevents the free and proper interchange between the oxygen of the air and the carbon of the blood.

Thus it is that all three causes exert the same influence; they interfere with the proper decarbonization of the blood. Vitiated with unexpelled carbonaceous impurities the blood circulates through every organ and tissue of the body, disordering the whole, and laying the foundation of tubercles.

Before concluding this part of my subject, I think it necessary to say a few words on a question that has often engaged the attention of physicians, and which has been lately again

brought prominently forward by Dr. W. Budd, of Bristol, and simultaneously investigated by M. Villemen—I mean as to whether *contagion* ought to be enumerated amongst the causes likely to produce this disease. The subject is of the greatest importance, but its solution is at present attended with much difficulty, and the results of all investigations are far from satisfactory.

Medical opinion has always hitherto tended most strongly in opposition to this idea, in illustration of which I may quote a passage from Dr. Elliotson's work on diseases of the chest:—"I do not believe that it (consumption) is in the slightest degree contagious; I have, like every one else practising medicine, seen hundreds and hundreds of cases of the disease, but I never saw an instance in which there was a shadow of probability of contagion."

The following facts, however, appear to be well established, and they would almost lead us to believe in the contagious nature of the disease, were we not able to account for them upon other and more rational principles.

It is not unusual to find consumption manifesting itself in a female who has watched by the couch and shared the bed of a departed relative through a long period of lingering decay, nor yet in males between whom similar domestic relations have obtained, and the same causes been in operation; but in these cases it may justly be argued that an hereditary predisposition or constitutional proclivity to contract the disease previously existed.

It is also a notorious fact that nurses in the phthisical wards of hospitals, apparently in good health and free from any constitutional indications of the disease when commencing their duties, very frequently become affected by it, and fall a sacrifice

to the faithful discharge of their duty. And even the resident physicians and students of these institutions often fall victims to the malady.

The records of practice furnish me with the history of several of both sexes who, having been in previous good health, and never having suspected or experienced any symptoms of pulmonary disease until they had watched with unremitting attention and anxious solicitude the last illness of a husband, wife, or child, have then lost their health, and ultimately manifested every indication of chronic consumption.

Now, at the first glance such instances as these would appear to go far towards proving the disease to be of a contagious nature, but I think the occurrence of the malady in them may be satisfactorily accounted for by the depressing nature of their several occupations, by the constant respiration of the impure atmosphere of the sick-room, by the want of sufficient exercise, and also by the fatigue, grief, and anxiety of mind to which they had been subjected.

All these causes I have previously shown to be most likely to produce that peculiar state of the system which favours the rapid development of tubercle.

P A R T V.



THE TREATMENT OF CONSUMPTION.

A TREATISE of this kind would be manifestly incomplete unless it contained some reference to the treatment of the disease which has been the subject of consideration ; but as it is intended for popular information, it will be unadvisable for me to enter into those details as to particular remedies, their compounds and doses, which would be indispensable in a more elaborate work.

I shall therefore content myself with pointing out the general principles on which the treatment of this disease should be conducted, and by describing those methods which I have found from experience to be most successful.

Guided by the important objects to be attained, I shall divide the plan of treatment, which I pursue and recommend, into four sections—namely, Preventive, Curative, Palliative, and Hygienic.

PREVENTIVE TREATMENT.

The prevention of disease is unquestionably more a matter of personal discipline than of medication. The advice and direction of the physician is to a great extent essential, but the careful attention, of those who are delicate or predisposed to the disease, to the rules prescribed for their guidance by their medical advisers is indispensable to success. There must not be

a mere compliance with his directions, whenever these harmonise with the convenience of those who are most concerned in the result of his prescriptions, but an intelligent, faithful and persevering adherence to all the regulations laid down by him with regard to the habits of life, dress, exercise and diet, as well as the use of such precautionary means as are calculated to counteract the evils of occupation, or the tendency to any functional and constitutional disturbance which he may perceive or suspect.

In the case of children of consumptive parents, this preventive discipline must obviously commence at the period of birth, and be sustained with constant vigilance, until maturity of growth and bodily development, with an absence of any well-known symptoms, establish the fact that the proclivity so much to be apprehended has been overcome.

It is precisely at this early period that the true value of change of climate can be successfully brought into play. When removal from a cold, damp and variable climate to one of a drier and more uniform temperature can be accomplished, with the additional advantage of an active life and generous diet, there seems to be every reasonable ground for hope that the occurrence of the disease may be averted. But it must be a period of complete expatriation until what may be called the amended constitution is fully established, with a careful avoidance of all those other exciting causes which are recognised as conducing to the production of the disease in any climate.

Unhappily, the function of the physician has been hitherto almost entirely restricted to the observation and management of cases, when disease has actually been established in the system and has become apparent even to the unprofessional eye. Now this is wrong; the indications of consumptive disease cannot be

detected too soon. It is better to suspect its existence, and to watch for and combat its earliest indications, than to discover the fact when the disease shall have made such progress as to render its removal difficult, or perhaps impossible. Frequent or even regular periodical examinations of the chest should be made at all periods of life, and more especially in those who are presumed to inherit any constitutional tendency, or who may be exposed to the operation of any of those causes by which, as I have already explained, the disease may be acquired. Similar precautions are adopted by many with respect to other organs of the body, why then should the lungs, vital and all-important as they are, be neglected? They are exposed to many more exciting causes of disease, especially in this climate, than any other internal organ of the body, but fortunately can be more easily and thoroughly examined and explored by mechanical contrivances.

Next in importance to the detection of the first indications of the disease, and strict hygienic discipline during infancy and adolescence in all that concerns the manner of life, I place the prompt removal of all catarrhal and bronchial affections, which are so apt to occur in approaching Winter and opening Spring. The best constitutions are not proof against the influence of atmospheric change, but unfortunately it is the common experience of our profession to find the 'cold' and 'cough' of these seasons often entirely disregarded. They return with each succeeding season, and because the system has sustained the trial of one or more attacks without apparent evil result, each renewal is neglected with an unreasonable expectation of the same impunity. But I have previously shown that there is no more fruitful source of consumptive disease, than the constant fretting of the lung tissue by the oft-recurring irritation of

'congestive colds,' and that the tendency of these affections to become chronic, or lasting in their character, is well known.

The regulation of the hygienic discipline and adaptation of preventive measures must necessarily be matter of consideration for the physician in every case submitted to his care, and he must be governed by the age, sex, condition in life and pursuits of the individual for whom he is prescribing at the time, in accordance with the well-recognised principles of medical science, and founded on his own experience, or that recorded by others. All that I can accomplish in this little treatise is to urge the necessity for care in so managing the progressive development of childhood into maturity, and every succeeding period of life, as to ward off the accession of consumptive disease, and to avoid or counteract the influences of those causes which are known to produce it. To do more than this would require the production of a more extended volume.

It is sufficient for me to arouse the attention of the general reader to the importance of the subject, and to refer, as I have done, both here and in the chapter on the Causes of Consumption, to those points which must be attended to in any system that may be adopted for the purpose of prevention.

CURATIVE TREATMENT.

The curative treatment of consumption has hitherto been attempted almost exclusively by medication through the digestive organs, by counter-irritation, change of climate, and dietetic regimen; and of late years the administration of cod-liver oil has been regarded by many as a specific remedy in the disease. It is not my intention to review the merits of any of the particular medicines which have been, from time to time, extolled as possessing the power of arresting tuberculous disease of the lungs,

nor yet do I wish to magnify the failure which has attended the use of the various means which have been resorted to.

Unhappily, the statistics of mortality from this disease are such as almost to justify the popular impression that it is incurable, and to create that dread of its occurrence which, by inducing concealment of its earliest indications, leads many into the grievous error of passing over the period when some well-directed effort might be made with strong hopes of success.

I simply desire to point out what I consider to be the most rational system of treatment we can pursue in every stage of the disease.

For the sake of clearness, I shall subdivide this portion of the treatment into two methods of procedure—*local* and *general* or *constitutional*.

By the first I seek to apply remedial agents directly to the diseased lungs; by the second I endeavour to sustain the vital power of the system, to obviate or correct any functional derangement of the other organs which may arise during the progress of the disease, and to produce such changes in the blood as will remove the tendency to the formation and deposition of tubercle.

Local treatment of the lungs, as I have before shown, can be very easily and effectively accomplished by availing ourselves of the natural function of respiration. In fact, medicines can be breathed as well as swallowed, and in being so breathed, or inhaled, they are carried to every portion of the lung structure to which the air, as the medium of their carriage, obtains access. They thus speedily reach the diseased parts, unchanged by admixture with any substance calculated to alter their composition or properties, and thus exert their peculiar action on the tissue with which they come in contact, or are transferred to the blood.

There are various forms in which remedies employed for local treatment can be administered, and there are several ways in which their direct application can be accomplished. For the sake of description and clear understanding of the subject, all inhalations may be divided into two principal groups—the *moist* and the *dry*.

In the first group, or moist inhalations, we have—

1. Warm vapours arising from water heated to various degrees of temperature, and charged with medicinal substances properly prepared for vaporisation.

2. Medicated spray, produced by mechanical force.

In the second group, or dry inhalations, we have—

1. Simple gases or vapours produced by heat or chemical action, and mingled with the air.

2. Minutely divided solid substances, or impalpable powders.

Each of these forms requires special apparatus either for their production or administration, such as an inhaler, an atomizer, with their appropriate tubes, the evaporating dish, properly contrived syringes, and lastly, the gas-chamber.

For the administration of medicines in combination with vapour of hot water, which I distinguish as moist inhalations, an instrument called an inhaler is necessary.

There are several forms of this instrument in use, a few of them bearing the names of those who have employed them or suggested their construction. Some of these I regard to be defective in the principle of their action, some are cumbrous and unsightly, some are difficult to keep properly cleansed, while others are easily put out of order. The following woodcuts describe a very portable, inexpensive and highly effective form of inhaling instrument entirely free from the foregoing objec-

tions, and to which I therefore give the preference and recommend to my patients :—

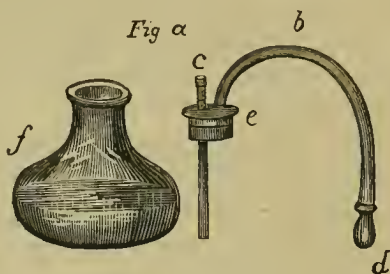


Fig. *a* displays the different portions of the instrument. *f* is a glass globe capable of containing about two pints of fluid; *e* is the stopper made of cork, and covered with a metallic capsule so perforated as to admit of the introduction of two tubes through its substance; *c* is an upright glass tube passing through the cork and reaching nearly to the bottom of the glass vessel, and permits a stream of air to enter and pass through the fluid contained in the globe; *b* is an elastic tube about twelve inches long, fastened at one end to the metallic cap of the instrument, over the second aperture in the stopper, and terminating at the other end in a glass mouth-piece, *d*.

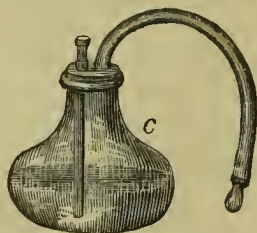


Fig. *c* displays the different portions of the instrument properly adjusted.

The mode of using this instrument is very simple. The glass vessel must be half filled with water, heated to a temperature to be determined by the prescriber according to the stage of the complaint, the nature of the remedies to be used, as well as the condition of the patient. To this water the prescribed quantity of the combination of medicines to be inhaled must be immediately added, and the neck of the vessel securely closed by the stopper and its attached tubes. Upon placing the glass mouth-piece between the lips, and drawing in a steady deep inspiration, the air rushes down the upright glass tube, passes through the liquid, and throws it into violent agitation; the volatilised medicines mix with this air and pass directly into the lungs without loss or alteration, and produce that effect upon the air tubes and cells which was designed by their selection. The act of inspiration being complete, the air in the lungs should be permitted to escape through the nostrils only, the lips being still kept closed on the mouth-piece—through which it should not be blown, or the fluid contents of the globe will be discharged by the upright glass tube. Some little practice is necessary to enable the patient to inhale properly, but the process is easily acquired, and calls for little effort beyond that of an ordinary deep inspiration, and is not accompanied by any inconvenience or fatigue. It may, however, be necessary at first, in all cases, to pause occasionally, and especially when the breathing is short and hurried by disease.

In performing the act of inhalation, the patient should assume the easiest attitude consistent with the condition of health. The best position, when the strength permits it, is to keep the body erect while standing or sitting. But the recumbent posture may be had recourse to, when the debility is such as to preclude the possibility of keeping the upright position for a sufficient length

of time. The dress should be loosened around the throat and waist, and every mechanical impediment to a free and full inspiration carefully removed. The daily number of inhalations and their duration, must, of course, be a matter of prescription in each individual case, regulated both by the strength of the patient and the effect which it is desirable to produce.

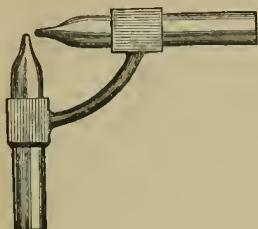
Fresh water and fresh medicines must be used at each time of inhaling, and I need scarcely add that the instrument, in all its parts, must be kept scrupulously clean.

From what I have now said, the advantages of this instrument will be at once apparent. It is extremely portable, easily cleansed, not liable to get out of order, readily set in action, and by its use produces a direct and prompt medicinal effect upon the lungs, which is indispensable to the successful treatment of diseases of these organs.

One of the earliest and most marked effects of inhalation is an increased freedom of respiration. This results partly from the mechanical expansion of the lung tissue, and the dislodgement and expectoration of accumulated and adherent secretion, and partly from the soothing effect produced by the inhaled vapour acting directly upon the inflamed or irritable surface of the air-passages. By its continued use a constitutional effect is produced on the system through the medium of the blood, into which the medicinal particles obtain admission in obedience to the vital laws of absorption. By varying the medicines put into the water, the effects produced upon the lungs are correspondingly changed, hence it is necessary that they should in every instance be prescribed with careful reference to the requirements of each case.

Another mode by which moist inhalations are administered is by means of the instrument called an atomizer.

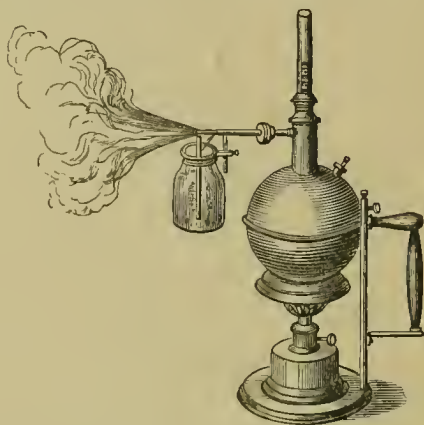
It has been established as a principle in pneumatics that when a current of air passes forcibly over the orifice of a tube, and at right angles to its long axis, a vacuum is created which induces an upward current in the tube. Availing himself of the knowledge of this principle, Dr. Bergson constructed an ingenious instrument for producing a shower of spray. Two glass tubes with narrow openings are connected at right angles, thus:—



Now, if the upright tube be placed in any fluid and the horizontal one be forcibly blown through, the fluid will rise in the tube, and as soon as it reaches the orifice and meets the current of air, it is immediately dispersed in the form of spray. By means of this ingenious, simple, but highly scientific contrivance, we are thus enabled to render medicinal solutions respirable. Various expedients are employed to accomplish the spray-producing force; such as an elastic bag with valves, so arranged that it shall act the part of a bellows. This requires, of course, a certain amount of exertion on the part of the patient or an assistant which is not at all times convenient from the fatigue which it produces.

The apparatus of Siegle, here represented, is as yet the most manageable and effective, and possesses manifest advantages over the bellows. Here the blowing force is exerted by

jet of steam generated by a small boiler. It is self-acting, and thus renders any effort on the part of the patient or attendant unnecessary, and we are able to combine with the medicinal solutions a certain amount of watery vapour, which is known to exert a most soothing and beneficial effect on the mucous



membrane. In those cases in which the presence of watery particles may be deemed inadvisable, the bellows power must be had recourse to; but then we possess other means of administering medicines in the form of vapour free from this objection, and which I term dry inhalations, and shall now proceed to describe.

Dry inhalations are prescribed when it is desirable to administer medicinal substances free from watery vapour.

The following woodcut represents a portable and simple apparatus, by means of which these dry inhalations can be very successfully administered. It consists of a light wire stand and frame, supporting a small porcelain dish capable of holding the

powder or liquid to be vaporised. The heat is applied by a small spirit-lamp placed below the dish.



By means of this little apparatus substances can be volatilized with speed, and by selecting those which are merely changed in form and not decomposed by the heat applied, we obtain a most efficient and powerful method of medication. This apparatus is used to medicate the air of the room in which the patient sits or sleeps, thereby maintaining through the act of respiration an almost constant action on the diseased surface of the lungs, or the vapour can be more abundantly inhaled by holding the mouth over it as it rises from the dish.

Another contrivance, by which medicinal substances may be rendered volatile and respirable when the air of the apartment is impregnated with them, is in the form of the Pastille.

This consists of a small tinfoil cone, filled with a combination of vegetable and mineral substances in such proportions as the prescriber may deem necessary for the particular case under treatment. The soothing effect of the vapour thrown off, by properly composed pastilles, in all forms of difficult and spasmodic breathing, is well known, and no asthmatic patient who has once tried them fails to have recourse to them during a paroxysm of the disease.

They are also particularly beneficial in cases of chronic consumption and bronchitis, where they act as a powerful expectorant and sedative, tending to unload the air-tubes of mucus, and soothe the inflamed membrane.

The vapours thus generated are freely diffused through the atmosphere of the room, and by this means a continuous action is maintained insensibly to the patient, and requiring no effort on his part to secure it. It exerts no injurious influence on the stomach, which is so frequently the case with medicines otherwise administered. When diluted by the air these vapours are not in the least hurtful to healthy lungs, nor even unpleasant to the senses.

For the exhibition of powdered medicines, technically termed insufflation, various modifications of apparatus are employed. The principle of action in all, however, is the same; they consist of two material parts, a tube to contain and direct the jet of powder, and a syringe or elastic bag for exerting the propelling force. In affections of the passages of the nose, the fauces, or back part of the throat, the tonsils, and opening of the windpipe, this method is an important and valuable adjuvant; but I do not consider it to be admissible where the disease is situated in the bronchial tubes or air-cells of the lungs, nor am I aware that any results have been obtained from its employment, in cases of the last description, which would justify its adoption in preference to vapour or spray; while there are some grave objections to the practice of applying to the delicate structures of the lungs hard particles which could only tend to create irritation by their presence, and in the instance of the less soluble kinds of medicine (for which, of course, this form of administration can only be preferred) these would be very likely to accumulate and thus become an exciting cause of disease.

The gas-chamber, it may readily be conceived, is better adapted for hospital use, or for the physician in his own consulting-room, to which his patients can go for its employment, under his own supervision and control. It is not portable, and requires certain adjuncts for successful use, such as retorts to generate, and gasometers to contain the gases, the management and manipulation of which demand the presence of an experienced attendant.

This is a most powerful, valuable, and yet simple means of administering medication to the system, and so acting on the constitutional condition of the invalid as well as upon the diseased portion of the lungs themselves. It is computed that all the blood in the body is submitted to the action of the air in the lungs once in every two minutes and a half. Such being the case, if a patient remain in a gas-chamber ten minutes, the blood will have made four complete circuits of the body, and thus have been four times thoroughly submitted to the action of the gases or medicinal substances contained in the atmosphere which he has been inhaling.

This form of administration, valuable as it is, is more applicable to the earliest stage of the disease, a period when, unfortunately, the aid of the physician is very rarely called for.

The establishment of Beddoes at Bristol many years ago, in conjunction with the illustrious Davy, then in the spring-time of his fame, was projected with the view of supplying this desideratum, but was abandoned from causes foreign to the intrinsic merits of the system itself. A similar establishment was started at Lyons, in which the use of the natural and of factitious atmospheres, under various conditions as to temperature and pressure, are employed.

The general or constitutional treatment of consumption must depend upon the conditions which present themselves in individual cases; for there are functional complications which accompany the progress of the disease, and which arise from certain circumstances peculiar to the individual, and must be duly considered in prescribing for their relief or removal.

There are, however, certain general principles sufficiently well established for our guidance, founded on the accumulated experience of many eminent men, and which can be variously employed and adapted to the requirements of the case immediately under consideration. These I shall now proceed briefly to consider.

One of the most prominent features of the disease, that feature, indeed, from which it derives its popular name of "Consumption," is a wasting of the natural tissues. This is due to a great extent to defective power in the assimilative function of the digestive organs. Our attention must always, therefore, be directed to the improvement of this function, by the administration of such internal remedies as are known to promote the healthy action of the stomach, the liver, and the intestines.

In the class of medicines called tonics, the physician has abundant material for choice; and yet it is remarkable how difficult it is to select the particular medicine which will, in all respects, suit the peculiarities of the constitution for which he is prescribing. The preparations of iron, either alone or in combination with quinine, and some of the mineral and vegetable acids, are favourite medicines with a large proportion of practitioners; but there are many persons in whom they fail to produce the desired effect, while some stomachs will not tolerate them at all. The same remark will apply to the use of

potassium, manganese, and ammonium, in combination with iodine, bromine, and phosphoric acid. Some of the compounds of these various substances possess a high reputation, and have been much lauded for their efficacy in certain cases, and unquestionably justly so; but the recorded beneficial results have been due, I think, more to the constitutional peculiarities of the person to whom they were administered, than to any special virtue in the remedy, or the compound, itself. It may be safely affirmed that there is no one medicine universally applicable, and the selection of the medicinal compound to be given must depend upon the individual experience obtained by the physician during the treatment of each case.

The great objects to be kept in view, in determining on this part of the treatment, are to incite the appetite for food, to secure its proper assimilation, and to correct those irregularities of function which make themselves apparent by the various well-known symptoms of indigestion. Much of this can undoubtedly be achieved by the careful regulation of the diet—a point to which I shall again refer under the head of hygienic treatment—but recourse must be had to the use of such medicines as possess tonic and alterative properties, for in an exhaustive disease such as this, when the vital powers are depressed, we must make up for the loss of activity by artificial means such as this class of remedies presents to us.

I am well aware that it has become the fashion, founded on the opinions of several physicians of high repute, to rely almost exclusively upon cod-liver oil, accompanied by a mineral acid, as a means of cure in consumption. On the first introduction of this oil as a medicinal agent, many ingenious theories were propounded as to its peculiar mode of action. It was supposed that the tubercle deposited in the lungs became coated by a

layer of fatty matter which protected it from the influence of the air, and thus prevented the occurrence of those changes which were observed to be natural to the deposit, and which I have already described in the section on the Nature and Source of Tubercle. This fanciful idea had to be abandoned, because it was clearly demonstrated by pathological investigation that this series of changes commences from the centre of a tuberculous mass, and not from the circumference. Other equally theoretical explanations were put forward and speedily abandoned. Finally, it was suggested that iodine existed in the oil, and that owing to the presence of this substance, and its specific property, the tubercle was dissolved or absorbed.

It has been questioned by some chemists whether iodine really does exist in the oil, and it is affirmed that, even if it does, it is in such minute proportions as to require a large quantity of the oil to furnish an ordinary dose of the medicine, and this could, of course, be administered in another and less repugnant form.

I believe the most correct view to entertain of the value and action of cod-liver oil is, that it is readily taken up by the system, and thus supplies material for waste to the sparing of the natural tissues, and at the same time saves the stomach from much labour in digestion.

We know from experience that, when the stomach bears it well, those who take it appear to sustain the drain on the vital powers, which characterises this disease, for a long period and some will even fatten on it. But I think they would do this equally well on other substances as articles of diet. I am convinced that as a purely medicinal agent, cod-liver oil possesses no specific power over tubercle, or any other form of deposit derived from the blood. It is simply nutritious, and

this to a limited extent only, and I know that other authorities concur with me in this view.

Dr. Swett observes on this subject :—"Cod-liver oil has not, in my opinion, any specific influence in consumption. It has not, in my experience, performed any wonderful cures. I do not, however, mean to deny its usefulness in this disease. It certainly appears to diminish the emaciation, and to improve the appetite. It is good nourishment, nothing more; and I think it very probable that other kinds of oil, equally well prepared, may exert the same beneficial influence."

Dr. Edward Smith also says—"I venture also to affirm that cod-liver oil, when it acts beneficially, often does so by the local action upon the throat, producing the soothing effect and relieving the cough, to which so many patients ascribe its utility."

Dr. MacCormac also speaks very strongly on the subject. He remarks—"All the codfish that swim in the mighty ocean, were they converted into oil, could not, would not, relieve or avert, were it but in a single instance, consumptive tubercular decay."

It is fair to presume that if this oil were possessed of any remarkable medicinal properties, exerting a specific effect on the development or progress of tubercle, the statistics of mortality from consumption should have revealed, long ere this, well-marked results as to its curative powers; but we do not find this to be the case, the ratio of mortality remains the same. We may therefore justly discard it from this class of our remedies, but give it due place among our hygienic agents. It is an important dietetic aid to a proper and rational treatment of many cases of consumption, and should be so esteemed both by the public and the profession.

Before concluding this portion of my subject, I desire to

point out what, according to my experience, appear to be the results which may be reasonably expected from this method of treatment.

In *incipient consumption*, when the constitution is good, and the general health but slightly impaired, the further development of the disease may be arrested, absorption of the tubercles promoted, and the complete restoration of the health established by suitable inhalations.

In *the second stage of consumption*, when the depositions exist as crude tubercles, the disease being confined to a circumscribed portion of one lung, and the constitution but slightly impaired, cure is effected in two ways, as I have already pointed out, in which either a change takes place in the character of the deposit, or by the softening of the tuberculous matter and its expulsion from the lungs by expectoration, leaving an open excavation or cavity, which is subsequently healed by the action of the inhaled vapours.

In *the last and confirmed stage of consumption*—that is, when a greater or less portion of the lung is already broken down, forming an ulcerous cavity, the possibility of cure depends wholly on the extent of the disease and the amount of the constitutional taint and disturbance. If the destruction is limited to a part of one lung and the surrounding textures are healthy, as is often the case, cure takes place by the healing of this cavity in the same manner as in the second stage.

If the disease, on the contrary, involves the whole of one lung, the prospects of recovery are greatly diminished; but still cure is possible so long as the other lung retains its integrity and is unobstructed in its functions. Life may be preserved even after the destruction of one lung. A person in this condition cannot have the same power of endurance in pursuit of

his ordinary occupations, but he may still live and enjoy comparative freedom from suffering for many years. In such cases, which have hitherto been considered as hopeless, a properly conducted course of treatment by inhalation has produced the following marked effects; the cough and expectoration have been materially controlled, and all the constitutional disturbances greatly modified. In this condition the patient may remain stationary as regards flesh, although this will be, of course, below the former standard, which proves most satisfactorily how entirely the capacity of the lungs regulates the appropriation of nutriment.

When both lungs are involved in extensive disease, cure is impossible, and it is folly ever to hope for so great an improvement in the healing art as to embrace these cases among the list of curable. The most that can be accomplished is to afford relief by cleansing the lungs from mucus and pus, which obstruct the bronchial tubes and thereby add greatly to the ease of breathing; to soothe the cough and allay the irritation of the lung, so as to promote sleep, and make the patient comparatively comfortable. But, in defiance of any skill within the power of man, the duration of life is a question of weeks or months. This, however, is no reason why some well-directed effort should not be made to procure the greatest amount of relief possible, and this can be more confidently looked for from the aid of inhalation than from any other mode of treatment.

From the above remarks it will be seen how necessary it is for those who are predisposed to pulmonary disease to keep a close watch over the earliest perceptible signs of its approach. All authorities agree that in its early stages consumption is as amenable to treatment and as curable as any other form of disease. It cannot be known too soon who are the subjects of

it, and it is impossible to ascertain this but by a most thorough, careful, and frequent examination into the constitutional and local symptoms of the disease.

If the lungs are sound and healthy, an examination cannot produce the disease, and if any evidence of the malady be detected, the sooner the patient comes under treatment the better chance there will be of his deriving benefit, and the stronger probability of an ultimate cure being effected. The treatment should in any case be persevered in so long as the least vestige of the disease remains.

PALLIATIVE TREATMENT.

During the progress of every consumptive case, certain complications arise which aggravate the condition of the patient and require the adoption of means for their removal, and efforts to palliate the suffering they produce.

The Cough may be increased in frequency and severity; it may become hard, dry, and even spasmodic in its character. Some modification of the composition of the inhalants by the addition of sedative, demulcent, expectorant, or antispasmodic medicines will often be sufficient to control this symptom; while the burning of an appropriate pastille rarely fails to soothe the paroxysms and to promote expectoration.

But it may sometimes be necessary to combine the administration of some of those medicines by the stomach which are known to exert a powerful influence on the nervous system, through which this altered character of the cough is frequently produced. In the selection of medicines for this purpose every physician has some preference, both as regards the kind and the form of its administration. Whatever these may be, however, all the compounds employed owe their virtue to the

presence of one of the well-known narcotic or sedative medicines, such as opium, henbane, hemlock, indian hemp, or prussic acid ; to which may be added antimony, ipecacuanha, and squills, with the view of exciting expectoration, when this is difficult. All these medicines exert a prejudicial effect on the digestive powers, especially from prolonged use, and should be carefully chosen and sparingly employed. It is better to give one simple substance at a time in sufficient quantity to produce the desired effect, than to make combinations which frequently offend the stomach and impair the appetite, thus interfering with the nourishment so essential in this disease. I have frequently found a few drops of chloroform given in gum-water, or camphor julep answer the purpose, and cause no unpleasant results. It is important in many stages of the disease to promote free expectoration, for should accumulation of the morbid secretions take place in the air-cells and smaller bronchial tubes, we witness that shortness or difficulty of breathing which is so distressing to the patient ; and the cough which occurs so commonly after the period of sleep during the night, as to have acquired the name of the 'morning cough,' is but the natural effort to dislodge this accumulated matter, and so relieve the breathing. It is well to remember this, and not to have recourse to any means to check this latter form of cough, which will gradually subside when the air-passages are clear.

The difficulty of breathing, however, does not always depend upon accumulated secretion, but upon its character, which when viscid and sticky is difficult to get rid of, and frequently produces severe and long-continued fits of coughing, by which the breathing is hurried and the patient exhausted. Now it is that the aids just referred to are admissible, and in the employment of which the physician is called upon to exercise great discrimi-

nation. It is under these circumstances that the value of warm, moist, and properly medicated inhalations is made so strikingly apparent.

Pain is a symptom of frequent occurrence, varying in position, duration, intensity, and other characters, according to its seat and causes. I regard it as usually denoting pleurisy, more or less partial; neuralgia either of the pleura or walls of the chest; or it may be rheumatism of the muscles concerned in respiration. For the relief of this symptom the physician must have recourse to various expedients, determined by his own view as to its origin.

The use of warm and stimulant poultices, stimulant and sedative liniments, is essential. Counter-irritants may sometimes be requisite when the cause is inflammation, especially of an acute form, but they should be employed with great caution and discrimination.

There are several remedies for internal use which enjoy a high reputation in controlling the pain of neuralgia and rheumatism, and it is a matter of indifference which is selected, provided it is not one which is likely to depress the vital powers of the patient, or impair the digestive function. My convictions on this point are that, except in decided inflammatory pleurisy, any treatment which interrupts the continuance of the ordinary course being pursued for the primary disease is most objectionable, as calculated to depress the system and retard the cure.

The Fever which, in some form, accompanies nearly all the stages of consumption, and is more or less modified in character and severity by these, particularly during the last one—in which, from its distinctive features, it acquires the name of ‘hectic,’ and which is also seen in all diseases accompanied by exhaus-

tive discharges and structural waste—calls for the careful consideration of the physician.

It is symptomatic of the mischief going on in the system, and while therefore our greatest success in subduing it will depend upon the efficacy of those measures we employ for the arrest of the diseased condition from which it arises, we can generally do something to control it by judicious medication. In the earlier stages of the disease it assumes much of the intermittent type, and observes a somewhat constant periodicity, being marked by a cold, a hot, and a sweating stage, and occurring principally towards the afternoon; the perspirations usually taking place during the period of sleep.

For the treatment of this symptom I am disposed to rely very much upon the judicious use of quinine in combination with some acid, such as sulphuric or nitric.

Tepid sponging during the hot stage is most desirable; and free exposure to the open air, with exercise during the period of intermission, should not be neglected. Great watchfulness as to the due performance of the natural excreting functions during the persistence of this fever will also be required.

Night-Sweating.—This is present in the more acute form and in the last stage of chronic consumption. It is not always preceded by fever, and is an indication of excessive debility; it occurs invariably during sleep; sometimes if the patient dozes even for a brief period during the day. It is frequently so excessive as to saturate the under-clothes and bed-linen. The acid tonics are often useful in moderating this symptom, and the oxide of zinc, in combination with henbane, is regarded by many physicians as almost specific in checking it. It is most depressing in its effects, and often baffles the best efforts to control it. Our chief reliance, as in the case of hectic fever,

must be placed upon the success of our remedial measures in arresting the local disease.

Blood-Spitting.—There is probably no symptom accompanying this disease which sooner excites the fear of the patient than blood-spitting; and the aid of the physician is naturally always promptly and urgently invoked for its suppression. The remedial measures he may adopt will be determined by his views of the source from which the bleeding comes, and the causes which may have produced it. I have fully discussed the true import of the several forms of blood-spitting which are observed, in the section on the Symptoms of Consumption, and have now only to consider the means which are requisite for its arrest.

Perfect rest in the recumbent position is indispensable when the quantity is large, and the blood bright in colour and fluid. Every effort must be made to tranquillise the mental agitation which is always present, and which is so calculated to quicken the heart's action, accelerate the breathing, and thus increase the discharge. The moderate use of cool acid drinks will be desirable, and the application of cold to the spine is often very effective. It may be necessary also to have recourse to the administration of the acetate of lead in combination with opium and digitalis.

Where there is a mere streak or spot in the usual expectoration there will be no need for the use of internal remedies; a few hours of quiet, and a temporary diminution in the quantity, and change in the quality, of the diet will usually be sufficient.

The Diarrhæa.—This is one of the most troublesome symptoms which the physician has to encounter. In the earlier stages of the disease, when it sometimes occurs, the employment of the stomachic medicines usually recommended in this form

of derangement of the intestines is justifiable, and is generally successful; but in the more advanced stages, when it is most common and most persistent, the impropriety of administering medicines of this character soon manifests itself, if persevered with, by the failure of the appetite and other gastric disturbance. In very obstinate and severe cases I have had recourse to the use of nitrate of silver, administered both by the mouth and in the form of injection, with benefit. It is difficult also to manage the diet so as to give the nourishment which is very essential, and yet to avoid exciting any irritation of the mucous membrane of the bowels. The peculiarities of patients as to their tolerance of particular kinds of medicines or food must be carefully studied, and the effect of everything given closely watched.

Dyspepsia.—For the relief of the symptoms of indigestion which accompany the disease from its earliest commencement, the palliative means to be employed must be determined by the prominent symptom at the time. Constipation must be prevented by the use of mild aperients. I have always found the combination of the extract of nux-vomica with rhubarb and some mild mercurial preparation answer my expectation. The nux-vomica seems to exert a specific tonic effect on the muscular coat of the intestine. Flatulency must be relieved by some warm aromatic and alkaline. I have great confidence in the beneficial action of a combination of alum and ginger for this purpose. The formation of gas in the stomach and large intestines on which this symptom depends arises from the presence of acid, the result of imperfect change in the elements of the food. The admixture of lime-water or lithia-water with the food will also be useful.

Nausea may be allayed by effervescent alkaline drinks; while pain arising from gaseous distension will be relieved by warm

applications, by means of stupes or poultices containing mustard or turpentine.

HYGIENIC TREATMENT.

The hygienic management of disease is perhaps the most comprehensive portion of a physician's duty in prescribing for the treatment of his patient. It includes all the necessary directions with regard—1st. To the proper ventilation of the apartments of the invalid, and the selection of suitable localities when, from any peculiar circumstances, it may be necessary to employ a temporary change of climate. 2nd. The regulation of the diet, as to the time of taking the meals, the nature, quality, and amount of the food and drink to be employed. 3rd. A due attention to the clothing and manner of dress. 4th. The limit, mode and periods of exercise; and lastly, the use of bathing. On each of these points I shall now enlarge somewhat, premising that no definite rules can be established which shall be universally applicable. The physician's directions on these various points can only be given with advantage after a careful consideration of the condition and circumstances of the individual for whom he is about to prescribe. And I may here add that the medical attendant is in a great measure dependent upon his patients or their friends for the success of his efforts in respect to his hygienic treatment. There is no particular with regard to the personal history of his patient which should be withheld from him, and his directions should be carefully attended to and faithfully carried out.

On Ventilation.

A large proportion of our diseases are produced by the condition of the air we breathe. It may be bad in quality—

that is to say, charged with noxious vapours or irritating impurities, variable in temperature or subject to sudden transitions in electrical condition.

Each of these sources of evil produces an immediate effect upon our health. In some the effect is a direct, and in others an indirect, cause of disease. The changes in the temperature of the air are less serious than those in its purity. The former produces active inflammation, which, when properly treated, is speedily overcome; the latter is the parent of low fevers and consumption. The former is the most speedy in its influence on the health, the latter probably the most fatal in its effects.

The influence of pure air is seen in those who live active lives in the open air—riding, walking, or working.

The effects of impure air, on the contrary, are seen in the anxious and pallid visage of the indoor mechanic, in the fragile form and hectic-tinted cheek of the sempstress, or everywhere, in fact, when great numbers of human beings are crowded together without the means of sufficient ventilation, or ample and continued renewal of the air of the apartment.

The purity of the air breathed is a necessary condition for health. This purity is destroyed by the uses man makes of it.

One of the great causes of deterioration of the respirable quality of the air is, as I have before stated, the presence of a large proportion of carbonic acid, the product of respiration; hence this function itself becomes the chief cause of impurity.

Another great source of atmospheric deterioration exists in the use of fires and artificial lights, which, during their combustion, consume the oxygen of the air, and give forth carbonic acid gas and watery vapour. The blackness of the ceiling over gas-lights denotes the amount of solid carbonaceous matter given off in minute particles, which being drawn into the lungs

during the process of respiration, produce a large amount of irritation in the bronchial tubes. Dr. Letheby, who has experimented extensively on this point, found a proportion of ammonia and foetid tarry matter resulting from the combustion of ordinary gas, and also a gaseous substance which becomes oil of vitriol by abstraction of oxygen from the air. He determined the proportion of this acid to be 212 grains in 1,000 cubic feet of gas, and we may readily conceive the prejudicial influence it would exert on the lungs.

When the air of an apartment or house which has been impaired by either of the foregoing causes is not properly renewed, very injurious consequences, varying in their character and intensity, are the result.

This is particularly the case in the homes and workshops of the poor, where a deficient supply of pure air is one of the chief causes of life being shortened.

If impure atmosphere is sufficient to induce consumption in the healthy, how much more is it calculated to depress those who are already suffering from the disease, and promote its fatal issue! It is obvious from what I have just stated, that our efforts should be directed to secure a constant renewal of the air in our apartments, and this may be easily accomplished by having a small opening near the ceiling communicating with the chimney, or with a flue expressly constructed for the purpose; the admission of fresh air should be provided for by apertures in the skirting of the room, at a lower level than the aperture of exit; these latter should be small and numerous, so that the air may enter in sufficient, but not excessive quantity, and in a divided state. Air must in reality be considered in the same light as food, and therefore the amount of supply, the condition in which it is introduced, and the equality of its dis-

tribution, are essential considerations in every well-ventilated apartment.*

On the Influence of Climate in the Cure of Consumption.

There are certain prevailing opinions in regard to the curative influence of climate in cases of consumption, which I consider to be not only erroneous, but also the occasion of disappointment and frequently of suffering to those labouring under the disease.

The chief source of these erroneous impressions is to be found in the encouragement given by most physicians to the practice of migration.

No sooner is it discovered that a patient is in a "confirmed consumption," than he is ordered off to some distant place in search of health, and is taught to believe that this is his only hope of recovery.

I shall now enter briefly on this subject, and endeavour to point out, both from my own experience and that of others, what may reasonably be expected from change of climate. Upon going over the works of those authors who have written upon this subject, it will be found that there is no climate in the world the natives of which are entirely exempt from this disease. There are, it is true, certain places in which the disease is comparatively rare, and in which the mortality is low, but as these places are situated in high latitudes and at great elevations, they present obstacles which render them peculiarly unsuitable for invalids, and should therefore never be selected for the purpose.

In Mr. Keith Johnston's admirable work on the *Geographical Distribution of Disease throughout the World*, we find the following statement:—"Consumption is rare in the Arctic Regions, in

* See Dr. D. Reid's work on Ventilation.

Siberia, Iceland, the Faroe Islands, the Orkneys, Shetlands, and the Hebrides."

All experience goes to prove that there is nothing curative in the air of those places to which invalids resort for health. When the body is not already greatly enfeebled by disease, the journey, absence from the cares of business, and the greater amount of exercise taken in the open air, unite to improve the general health; but the local disease is seldom arrested by such improvement. The air of the most favoured places of resort possesses no virtue to heal the lungs when diseased. This is proved by the circumstance that consumption is very common among the natives of those places which enjoy the highest reputation—Riviere, Nice, Rome, Naples, and Madeira.

These facts present in a strong light the fallacy of popular opinions on this subject.

Dr. Forbes, the learned editor of the *British and Foreign Medico-Chirurgical Review*, has stated that during a residence of five years at Penzance, a place very much resorted to by consumptives, he is sorry to say that in the great majority of cases change of climate was not beneficial. In no case of well-defined consumption did he witness a cure, or even a temporary palliation, that could be fairly attributed to climate.

Sir James Clark also bears similar testimony on this point. And if we add to this the fact, that in all cases where pulmonary tubercles are in a state of softening, or become softened during the sojourn of a patient in a warm climate, the malady is hastened and runs a much more rapid course to a fatal termination, invalids will realise some of the dangers to which they expose themselves by relying on this custom.

From the foregoing observations it will be seen I do not think that climate can or does exert any curative influence on con-

sumption, and that it holds but a secondary place among other means at our command, either for its prevention or cure.

Our knowledge and experience on this subject appears to stand thus :—

1. In cases of delicate health, or where an hereditary consumptive taint is suspected, but there is no actual proof of the existence of the disease, a prolonged sojourn in a warm climate offers great probabilities for the re-establishment of health. I have before referred to this point when considering the preventive treatment of consumption.

2. In those cases in which tubercles have formed, but the diseased action has not proceeded to the stage of softening, attended with purulent expectoration, the same kind of climate may prove beneficial, or it may prove injurious, the chance each way being nearly equal.

3. But when the disease has proceeded to the stage of ulceration, and the tuberculous matter appears in the expectoration, and where the stethoscope indicates that a considerable portion of the lungs is totally unfitted for respiration, then a warm climate is much more likely to accelerate than retard the fatal issue, and take away the few chances that remain of recovery.

Sir J. Johnson says—"If this be a correct estimate (it is at least an honest one) of the influence of a warm climate on constitutions disposed to, or affected by, pulmonary consumption, it shows that medical men incur a fearful responsibility in proposing to the parents and friends of invalids a measure which is fraught with danger, involved in uncertainty, and too often attended by the most destructive sacrifices of the feelings as well as the finances of the parties concerned."

The Diet of Consumptives.

A very important and beneficial change has, within the last few years, taken place with regard to the kind of diet proper for a person suffering from consumption in all its stages. This change has doubtless arisen from a better understanding of the nature of the disease, and a more thorough estimate of the value of generous nourishment in withstanding its inroads.

It used to be the practice to place all who were suffering from consumption upon the lowest possible diet, and to confine them to the smallest quantity of food that would support life. The milk of asses, and of goats, of deer, and even of mares, taken two or three times daily, in greater or less quantities, was in many instances the only nourishment permitted. Some physicians allowed buttermilk and eggs, taken once a day, in addition; while a few extended the diet to lichen, Iceland moss, and very weak broth.

Happily, at the present time all this is changed, and we now endeavour to support the strength and vitality of the system by a nutritive and easily-digested diet, and this, indeed, is found to be indispensable in all cases of phthisis.

If the tone of the system is not kept up, the disease rapidly gains control over it, the strength becomes exhausted, the vital powers weakened, and the malady goes on with redoubled energy to a fatal issue.

It is under these circumstances that we look for the benefit to be derived from the use of cod-liver oil and other oily substances, among which cream, in my opinion, holds the highest position, besides being more easily borne by delicate stomachs.

Glycerine has of late been strongly recommended as a substitute for fish-oil. It possesses the advantage of being much less

nauseous, and from its sweetish flavour, children take it readily, and derive great benefit from its use.

As to the diet suitable for each particular case, no general rule can be laid down, but in all cases of consumption it should be strong and nourishing; consisting of fresh meats, game, poultry, fish, fresh-laid eggs, milk, bread-and-butter. To these it is advisable, as I have just stated, to add a certain quantity of animal fat or oil. The merit of this oil appears to be that it requires very little change to prepare it for assimilation. In connection with this point I may refer to the remarks I have made elsewhere on the medicinal use of cod-liver oil. Fresh meats should form the basis of the consumptive's diet. They are generally easy of digestion, comprise a large amount of nutriment in a small compass, and contain in the greatest degree those very elements which the system requires to build up its waste. Fresh fish is not objectionable, though less nutritious than meat, and harder of digestion.

In all cases where patients are losing flesh, they should at once begin to rectify their diet so as to confine themselves to those articles only which are the most easy of digestion and yet contain the greatest amount of nutriment. All salt meat should be avoided, as tending to produce fever, as requiring stronger digestive power, and as not affording the same amount of nourishment in proportion to the quantity used that fresh meat does, the salting process having depreciated the nutritive quality. Foreign vegetables and fruits are also objectionable as tending to produce diarrhœa.

The food should be taken at equal intervals of about four hours daily, in sufficient quantity to prevent craving, but not to overload the stomach and produce distension. Food should also be particularly avoided immediately before retiring to rest,

as it is then apt to produce wakefulness and other disturbances arising from imperfect digestion.

With regard to the beverages most suitable in this disease the patient must be guided in a great measure by the effect produced, and use only those which are found to agree best with the stomach. Of all drinks, water is the most natural and the best. Next comes milk. The milk of asses and of goats has been much extolled, but I have never observed that either of these possesses any advantage over that of the cow. Tea and coffee may be used in moderation, but should be drunk weak, and always be of the best quality.

A moderate use of stimulants is sometimes indispensable, therefore ale or stout, or wine, or brandy much diluted with water, may be taken at the dinner meal, or at other periods of the day when the patient finds they are better tolerated. The sense of faintness, depression, and lassitude is by no means an unsafe guide as to the period when stimulants can be taken with the greatest advantage. It is better to employ them in this manner, as articles of diet, than to rely on the alcoholic tinctures used in the composition of most tonic mixtures, or to depend upon ammonia, which is but temporary in its action, and is often followed by a depressing effect on the general system.

Clothing.

There is probably no point of hygienic discipline so much beyond the control of the physician as that which concerns the regulation of the dress of his patients. The form of the garments is not regarded as coming within the province of his professional dictation, while this, as well as the materials of which they should be made, are so completely under the sway of fashion, that any strictures he may offer, upon the faults

of the first and defects of the second, are usually disregarded, if not treated as obtrusive and whimsical.

Yet, seriously speaking, there are as many dangers to be apprehended from errors of dress as from those of diet.

How painful it is to see children insufficiently clad both with regard to quantity and material, and this without the plea of poverty to account for the mistake!—the bare legs, arms and chest, even in cold, damp and variable weather, by which the whole course of their circulation is disturbed and perverted.

Driven from the surface by the action of the atmosphere, the blood is forced on the vessels of the internal organs, and engorgement takes place, which not only impedes healthy function but paves the way to structural change.

And yet this custom is sometimes adopted with the view of making them “hardy.” Cruel, fatal mistake! discovered when it may be too late to remedy the evil consequences arising from it, which manifest themselves in various forms of disease. But if this practice is wrong in those who are naturally strong, and in whom there is no reason for suspecting any weakness of the chest, how much more culpable when there is evidence of defective vitality and a susceptibility to bronchial irritation! I am no advocate for keeping the temperature of the surface very much above that which is natural to the body—and it should be remembered that in children this is proportionately higher than in grown persons—but I regard it as essential to their welfare that the temperature of the whole surface should be maintained as equable as possible, and particularly that the extremities should be kept warm and dry. This rule applies all through life.

It is not expedient that the clothing of children should be multiplied for this purpose; indeed, the lighter the material of

dress is, consistent with its heat-retaining qualities, the better. This condition applies equally to all ages, but more particularly to youth and old age. It is not the number or weight of the garments which will insure the greatest protection from the varying external temperature, nor should the texture of those worn next the person be such as to interfere with the perfect exhalation from the surface. I repudiate the custom of wearing chamois-leathern jerkins next the body; they soon become saturated with the oily particles thrown off from the skin, and then the perspiration accumulates, clogs the pores, and thus interferes with its proper function. Knitted woollen fabrics for winter and cotton ones for summer are undoubtedly the best, and if the under-clothing is sufficient in texture, and covers the body uniformly, the outer garments need not be so numerous.

I think the generality of persons clothe themselves too heavily in winter and too lightly in summer, but I shall have occasion to revert to this point. Next to partial coverings of the surface in children, I condemn the practice of girthing them up with the idea of forming the figure during growth. Undue pressure anywhere, especially around the chest and body, is most pernicious, interfering as it does with proportionate development of the whole frame, and preventing the due performance of function by those organs which are thus compressed. I have already alluded to the evils of tight-lacing in females as a producing cause of consumption.

Another injurious custom with youths of both sexes consists in the extreme change which is made between the dress of the day time and evening. Among females, during the day, even within doors, the whole person is covered, and the materials of which the dress is composed are thicker; at night the arms and upper part of the chest and neck are bare, and the materials are of a

thinner texture. The risks attending this change are increased by incautious exposure to changes of temperature, and in summer especially to currents of air when heated by the exercise of dancing or the temperature of crowded rooms. Few have the forethought or will take the trouble to employ additional means of protection against these sources of danger; a sudden chill and suppressed perspiration will frequently produce a congestive attack of some internal organ, which, although transient in its immediate effects, must, from frequent repetition, sow the germs of ultimate mischief, and the lungs are the most exposed to the danger, especially where there is an already existing tendency to disease. The same cause of danger exists with regard to males, modified only in degree, inasmuch as the difference of dress is not so great, particularly with reference to exposure of the person.

What I have just stated applies more particularly to the regulation of clothing as a preventive measure, but the principles upon which my observations are founded apply equally to those who are already the subject of disease. The clothing of the consumptive should be as light as is consistent with sufficient warmth, and the whole person should be kept well protected, and the temperature as uniform as possible night and day.

An under-garment of woollen material, reaching from the throat to the ankles and wrists, capable of absorbing the perspiration, and yet not sufficiently porous to permit the rapid cooling of the body on unavoidable exposure to change of temperature, is indispensable, and a change should always be made between the garment of the day and the night. In summer this may be of a thinner texture than that worn in winter, but still of woollen stuff. I am aware that silk has been proposed, and in some degree preferred from a supposition of its preserving the electrical state of the body, but I believe this to

be a mistaken idea, while it is open to the objection of not preserving the temperature so perfectly, and not permitting such free exhalation from the surface.

The feet and hands should also be well protected, and this is not to be accomplished by the tightly-fitting kid glove or boot. A loose glove or shoe of cloth or woollen texture will be preferable for outdoor use.

The employment of a respirator has been strongly recommended, and when the weather is severe its use is always attended with considerable benefit. The best kind is constructed of fine silver wire-gauze, several layers in thickness, neatly framed, and padded to fit over the mouth, and covered in such a manner that when worn it resembles a black silk muffler. The wires become heated by the breath, so that on inhaling the cold air through the gauze, it becomes warmed before passing into the lungs.

The protection afforded by a properly-constructed respirator is so great that the patient can go out freely in the coldest weather with comparative impunity, and this instrument should be in the possession of every person who suffers from a susceptibility to colds. Sir James Clark very justly observes—"By keeping up the habit of going daily into the open air in almost all weather, under the protection of warm clothing, and with the additional assistance of a respirator during the prevalence of cold winds, persons with very delicate lungs may bring themselves to bear this climate, and even strengthen their constitutions to an extent not generally believed."

On Exercise.

In all ages of the world the value of exercise, not only as a preservative of health, but also as a remedy for the cure of

disease, has been understood by physicians, and ably expounded in many learned treatises. The ancient Greek physicians studied the subject in the practical school of the gymnasium, and were fully acquainted with all the evils and benefits arising from it.

In our day too little attention is given to this subject, and the most erroneous notions prevail among the people; some of the evil results are very forcibly illustrated in the case of the invalid. Do we not daily see those who are able to walk without any considerable fatigue shut up in close over-heated rooms, lest a breath of pure air should reach them; whilst others, reduced to the last extremity of emaciation by disorganisation of the lungs, are made to undergo long and tedious journeys on their way to a warm climate?

Proper exercise is that physical exertion which calls into use the greatest number of muscles, and should be carried to that amount which the patient can bear without fatigue. A walk of a quarter of a mile in disease may be equal to thirty miles in health. Every invalid should take regular exercise daily, which must be apportioned in quantity and in kind to the nature of the disease and the strength of the patient, and should always be determined by the physician, in accordance with the feelings and condition of the invalid.

This particularly applies to cases of consumption, and also to other diseases affecting the breath, as asthma and those of the heart.

Exercise in all these cases must be gentle, regular, never amount to fatigue, and be always taken on a level surface. Active and prolonged exertion is not only hurtful but dangerous. It excites the heart to violent action, increases the frequency of the pulse and respiration, and is liable to produce congestion of the lungs or hæmorrhage.

The consumptive should never, on any account, put himself out of breath, nor should the amount of exercise be sufficient to produce exhaustion. If he does this he will suffer more injury than he can derive benefit from it.

In the early stages of consumption, while the body yet retains its usual vigour, walking is the best form of exercise. It should be commenced moderately, and gradually increased as the muscles become strengthened by it.

When the patient is too feeble to walk, a ride of a few miles in an easy carriage every morning should be taken as a substitute.

Much difference of opinion exists as to the best time for exercise, some advising it in the morning, others in the middle of the day. Probably the best and most agreeable division of exercise in ordinary cases is the following:—Before breakfast take a walk of about five minutes' duration, during which make it a point to inflate the lungs several times to their greatest capacity, and then expel all the air from them by making alternately deep inspirations and expirations. Midway between breakfast and dinner, when the act of digestion is ended and the stomach empty, a walk or drive should be taken, and continued for such a time as the strength will permit, always remembering that it must stop short of fatigue, or it will do injury. Two or three hours after dinner this should be repeated in the same manner. Those who are very feeble will, of course, omit the walk before breakfast.

In addition to these outdoor exercises there are many kinds of passive exercise, such as swinging, rocking, inflating the chest, and the use of the dumb-bells, which may be resorted to indoors when the state of the weather prevents the patient from going out.

Much misapprehension exists in regard to the influence of the weather, and, as a consequence, few invalids take half the exercise they should and can take with perfect safety in the open air.

Rain is an insuperable objection; and a raw, damp, windy day should never be braved under any circumstances. Snow, on the contrary, when unaccompanied by wind or sleet, offers no obstacle to exercise in a covered carriage. The influence of a dull, cloudy day is felt almost as much in the house as in the open air, and the necessity for exercise is quite as imperative as on a fine clear day. With a clear sky overhead—though there may have been recent rain—the invalid may drive out with entire safety. During the autumn and winter, dry cold days are the best for outdoor exercise, and with the protection of a respirator, invalids may go out in the coldest weather, not only with safety, but with comfort to their feelings and benefit to their health.

On Bathing.

There is, perhaps, no subject upon which so much ignorance exists as upon the subject of bathing. This, in all probability, arises from the very defective sanatory arrangements of the generality of houses in this country, a bath-room being a luxury attached only to the dwellings of the wealthy. The constant use of the bath is, however, almost an essential to perfect health. The ancient Greeks and Romans were keenly alive to the necessity and wholesomeness of the practice, and even now among the Eastern nations the custom of daily ablution is rigidly observed, and by some is even regarded as a matter of religious discipline and superstitious faith.

I now intend to make a few observations upon this subject,

and these will apply with equal force to all who have recourse to bathing, either as a restorative means while convalescing from debility caused by previous illness, or as a preventive against a predisposition to disease caused by climate, change of season, or the influence of an impure and poisonous atmosphere.

To those among the healthy and robust who habituate themselves to this custom, I believe cold bathing to be equally as beneficial in winter as in summer, and to a large proportion of these I think that the form of the bath is merely a matter of preferential choice, whether this be by the plunge-bath, the shower-bath, or by simple sponging. There are many persons, however, to whom, from certain constitutional peculiarities, both immersion and the shower-bath are intolerable, while to some they are even positively prejudicial.

Experience alone becomes, therefore, the best guide for the regulation of the form of the bath, as it would be difficult, if not altogether impossible, to decide in all cases which kind would be most proper to employ.

With the sick, however, and especially with those labouring under any form of pulmonary disease, the question assumes a different aspect.

In all these cases a bath, in its form, its temperature, and its period of use, becomes as much a matter of prescription by the physician as the medicine or the diet. And he can regulate this only after careful deliberation on the nature, stage, and complications of the peculiar form of disease under treatment. The constitutional condition of his patient, the season, the state of the weather, and the facilities for the proper administration at the command of those for whom he prescribes, must also be considered.

From these remarks it will be obvious to the reader that it

would be impracticable to lay down any specific rules for the guidance of consumptive invalids in the use of the bath; its employment by them must become a measure for individual consultation and advice.

There are, however, certain general maxims which ought to be clearly understood:—

1st. The use of cold water should be particularly avoided by those suffering from pulmonary affections.

The quantity of blood circulating in the superficial blood-vessels of the surface of the body is very considerable, and the action of cold water applied to the skin is certain to disturb the equilibrium of the circulation, and to drive back a large proportion of the blood on the internal organs, especially when these are already the seat of disease—and the weakest will invariably suffer—thus producing a liability to congestion.

2nd. The use of hot water should be avoided, as being immediately more depressing in its effects upon the system, and, from the increased circulation which it causes on the surface of the body, rendering the patient more susceptible, on the slightest exposure, to change of temperature and consequent risk of “taking cold,” or a sudden revulsion of blood upon the internal organs of the body.

3rd. Plunge-baths and shower-baths are also to be avoided by consumptives, as necessarily exposing the whole surface at once to the action of the atmosphere, and the sudden shock to the nervous system is equally prejudicial, being a frequent cause of disturbance to the proper action of the heart.

In all cases of pulmonary disease I recommend, as most bene-

ficial, the use of water as nearly as possible the temperature of the blood (90 degrees Fahrenheit). I also give the preference to sponging over every other form of bathing, recommending as a precautionary measure to uncover only a portion of the body at a time, and to regulate the temperature of the room by preventing draughts of air, and by having it sufficiently heated.

As the perspiration of the skin is apt to be acid, and highly charged with oily secretion, the use of a small quantity of an alkaline substance in the water, such as carbonate of soda, will assist the cleansing of the skin more thoroughly.

In the more acute forms of disease gentle frictions of the skin after the bath will be beneficial, but in chronic complaints this will not be so essential.

Great care should be taken not to expose the person to the open air immediately after bathing, but to allow the equilibrium of the circulation to be fully re-established before venturing forth, for it will be found that with every precaution a greater or less amount of constitutional excitement will always be produced.

It will readily be seen that I attach great importance to the act of bathing—not that I regard it as a specific or directly curative agency, but simply as forming a portion of the general hygienic management which cannot be too rigidly enforced by the physician, or too faithfully put in practice by all who seek relief from pulmonary diseases.

ILLUSTRATIVE CASES.

A MEDICAL writer generally encounters much difficulty in determining upon the manner in which he will make known the results of his practice, and particularly so in a publication of this description. It is important that he should illustrate the success of the system of treatment which he pursues, but in doing this due regard must be paid to the feelings of his patients, while at the same time he must be sufficiently circumstantial to identify the nature and peculiarities of each case.

While I have therefore carefully guarded against any undue publicity, I have nevertheless been as exact in my description on all points of interest as was indispensable for the object I had in view. In giving statements of the following cases which have been successfully treated, chiefly by the local method described in the body of the work, I have endeavoured to accomplish this without giving ground of offence to any person.

I believe that no patient would abstain from bearing private personal testimony to the benefit received from any system of treatment; but all naturally dislike the use of their names, residences, &c., in any species of publication.

The subjoined statements, therefore, must be regarded by the reader merely as abstracts from the professional records that I have in my possession.

A case of Incipient Consumption, accompanied by obstinate Chronic Catarrh and Enlarged Tonsils.

Miss A. F——, aged ten years, of delicate frame and scrofulous habit, but with no admitted hereditary tuberculous tendency. Two years before coming under treatment she had an attack of measles, from the effects of

which her mother stated that she never seemed to have recovered. On examination of the chest there was dullness on percussio, and loss of respiratory murmur at the upper portion of the right lung. The nostrils were in a state of ulceration, with constant mucous discharge which had existed more or less since her previous illness. The eyelids were also ulcerated, and there was poured out from them a highly-irritating secretion. The tonsils were very much enlarged, almost meeting, and in consequence the voice was imperfect. Her complexion was pale, and her flesh soft and flabby. The expression of the features betokened great languor, she was fatigued by the slightest exertion, and her respiration was quick even when at rest. Her sleep was much disturbed in consequence of these obstructions to breathing. She had hectic symptoms daily, with frequent copious night sweatings.

There was almost constant cough during the night and after the morning meal, with a yellow and somewhat glutinous expectoration. She was subject to occasional nose-bleeding with frequent frontal headache, so severe at times as to incapacitate her from study or amusement. There had been considerable loss of weight within the last few months.

The nature of this case was at once apparent, and called for prompt and energetic treatment. She was directed to inhale vapours of a soothing and astringent nature; daily applications were at the same time made to the nostrils and fauces by means of suitable syringes, and her general health was regulated by various forms of tonics. From having been previously closely confined to the house, she was ordered to live as much in the open air as the state of the weather would permit. Healing applications were also made to the nostrils and eyelids.

Her improvement was uniform and rapid. As the discharges from the mucous membrane of the nostrils and eyelids subsided, and the tonsils diminished in size, the character of the inhalations was changed, with a view to promote the absorption of the tuberculous deposit which evidently existed in the right lung. In the course of three months her urgent symptoms had disappeared, she had become plump, and was able to take active exercise without fatigue or difficulty of breathing. Her sleep was tranquil, and there was an entire restoration of the breath-sounds of the affected lung.

A case of Acute Consumption.

Miss T——, aged twelve years. About three months before commencing treatment she was observed to become languid and feeble, accompanied with slight hacking cough and difficulty of breathing. This continued until at length she was suddenly seized with fever and great prostration. The

medical man called in at the time pronounced her to be suffering from an attack of pleurisy and inflammation of the lungs, and described "the left lung as being completely blocked up." She had severe cough, great pain in the left side, with intense fever, and little or no sleep. After this state had continued for about three weeks, the cough increased in violence, the expectoration became profuse in quantity and of a yellow colour. There was great emaciation, she was unable to raise herself in bed, and had all the usual constitutional indications of rapid decline.

It was in this condition that she commenced the treatment by inhalation. This case being viewed as one of acute consumption, it became necessary to resort to every expedient calculated to arrest the progress of the disease, and save the patient's life. The case presented all the difficulty which the complication of inflammation of the lung always produces. The great object to be attained in the first instance was to subdue this inflammatory condition, and for this purpose warm soothing inhalants with counter-irritants to the affected side of the chest, generous diet, and free ventilation of her apartment, were prescribed.

As the urgent symptoms abated, astringent inhalants were employed for the purpose of controlling the excessive secretion. In about six weeks, in consequence of the subsidence of the inflammatory state, it became practicable to distinguish whether there existed any further diseased condition, and it was then discovered that extensive and diffuse tubercular deposits were present; and these must have existed previous to the occurrence of the inflammation, which would account for the symptoms preceding this acute attack.

At this time (her residence being in a low-lying portion of town) she was removed a short distance into the country, having so far recovered as to permit this change. From this period her improvement was uninterrupted, and in the course of six weeks she was found to have gained fifteen pounds in weight.

The form of the inhalations was varied from time to time as the condition of the symptoms demanded, and in six months she discontinued all treatment, and her father, in writing after her recovery, says—"I think the unfavourable symptoms began to abate as soon as she commenced the inhalation, and I confidently believe that to this part of the treatment is owing chiefly her rapid recovery and restoration to health."

A case of Chronic Consumption.

A lady residing in a northern suburb of London came under treatment in the month of October, 1864.

She was twenty-eight years of age, of slight frame and feeble constitution. When sixteen years old, she suffered from an attack of acute catarrh, which was never completely arrested, and became chronic, being aggravated by each recurring winter season. Cough made its appearance during this time, but it was only at the beginning of 1863 that her apprehensions were awakened with regard to the state of her lungs.

At the period of her examination she had constant hacking cough in the morning, accompanied by the expectoration of grey and yellow matter. There was a sense of tightness across the chest, occasional pains on the right side, and the breathing was much hurried. There were cold chills and feverishness daily, with occasional night-sweating. She was much emaciated and her strength greatly impaired. There was a granular and ulcerated condition of the throat and tonsils; the pulse was quick and feeble, and the digestive functions very much deranged. The stethoscope revealed the existence of circumscribed tubercular deposits in the left lung, which had evidently commenced to soften.

She was immediately placed under active treatment by inhalation; tonics were given internally to improve the digestive function, and counter-irritants were freely applied to the surface of the chest. Appropriate applications were also made to the nose and throat.

This treatment, varied occasionally according to the indications of the case, was persevered with during the space of five months, when, being restored to health, she was able to abandon all treatment, and has since remained perfectly well.

A case of Chronic Consumption.

J. H—, a young woman of a highly nervous temperament, and belonging to a consumptive family, came under treatment in the month of October, 1864.

She had been ailing for more than twelve months. She was found to be much emaciated and suffering from much languor and debility. On examination of the chest tubercular deposition was discovered in the right lung, with extensive bronchitis; there was constant cough, sometimes occurring in severe paroxysms, with copious thick expectoration of a greenish colour; great shortness of breathing, daily hectic, with night-sweating, the pulse being 100 per minute. There had also been occasional attacks of blood-spitting.

She was put under treatment by inhalation, with other appropriate constitutional remedies.

In the following February she was found to be much improved; the

cough had been less frequent since Christmas, and the breathing had become tranquil. In March the improvement was progressive, she having gained considerable flesh; the expectoration had diminished in quantity and altered in appearance. After steady perseverance for a period of six months she discontinued treatment, and in July she presented an improved appearance and her general health was good. Examination of the lungs showed a decided change in the character of the breathing, and an absence of those morbid signs which were so noticeable at the commencement of her treatment.

A case of Chronic Consumption, complicated with obstinate Bronchitis.

A married lady residing in the North of England, suffering from chronic bronchitis, following an acute attack five years ago, and who was engaged in sedentary pursuits, had very troublesome cough, with copious yellow expectoration occasionally streaked with blood; shortness of breath on any exertion, pain across the chest, frequent cold chills, irregular hectic, and occasional night perspirations.

There had been gradual loss of flesh, accompanied by great debility and impaired digestive functions.

On examination with the stethoscope, both lungs were found to be studded with tubercular deposits, and there was at the same time extensive and diffuse bronchitis. Softening also appeared to have commenced in the left lung. A most unfavourable opinion was expressed with regard to the nature and probable issue of this case.

She was, however, placed under a systematic course of local treatment, in the use of which she persevered for many months, and with the happiest results.

Since discontinuing regular treatment she has enjoyed good health, and has been able to follow her usual employment with comfort.

A case of Chronic Consumption of several years standing, simulating Asthma.

A lady of middle age, short stature, but with a well-developed frame and capacious chest, was first seen in the latter part of last year. In this case there was no admitted hereditary predisposition.

She had suffered for nearly four years from repeated attacks of bronchitis, pleurisy, and inflammation of the lungs, and had been variously treated by several physicians. She had sought shelter during the winter months at numerous favourite localities.

When examined in the month of October, 1867, her symptoms were as follow:—Constant cough which completely disturbed her rest at night,

occurring in violent paroxysms and accompanied by great difficulty of breathing. The expectoration was very profuse and purulent. There was a total inability to lie on the right side, with plenritic pains through the left side of the chest; occasional chills and daily hectic, but little or no perspiration at night. She had had frequent attacks of blood-spitting since her first illness. Her voice was much impaired, and her throat was irritable. There was not much loss of flesh, and, with the exception of a slight tendency to constipation, the functions were naturally performed.

The stethoscope indicated the existence of a considerable cavity in the right lung, over which the chest was depressed and flattened.

In view of the severity of this case, the great object was to conduct her treatment in such a manner as to avoid the necessity of removal from home, and at the same time to endeavour to heal the injured lung.

Inhalations of various forms, both by the ordinary inhaler and the atomizer, were freely and persistently used with very marked subsidence of all her troublesome symptoms. She can now lie with comfort on the right side, sleep tranquilly at night, the expectoration is less profuse and more easily brought up, and she expresses herself as having passed through the winter with greater comfort than she has for several years.

The preceding cases illustrating the treatment of the disease described in the body of this treatise are full of interest, and have been selected from numerous others available to me, but they are sufficient to establish the value and importance of the course pursued.

The following cases are intended to show the applicability of the same method of treatment to those diseases which are closely allied in their nature to the one under consideration, and which, as I have at some length pointed out, very frequently precede or accompany it, being indeed sometimes quite as formidable as consumption itself.

A case of Incipient Asthma.

Mr. C——, aged forty-seven years, a farmer by occupation, whose mother is reported to have died from asthma, came under treatment at the end of

1864. He had been suffering for three years with periodical attacks of difficult breathing, which had gradually commenced without any previous bronchitis.

At the time of examination there was very slight cough, and that principally coming on after meals; there was no expectoration, but great sleeplessness in consequence of the difficulty of breathing. He suffered much from headache and giddiness, cold feet and hands, imperfect digestion, and had lost flesh considerably during his illness: all showing the extent to which the circulation and nutrition were influenced by the want of sufficient aëration of the blood.

The stethoscope revealed the usual indications of spasm of the air-tubes.

He was under treatment by inhalation for three months. The improvement was gradual but progressive from the first, and when seen a year afterwards he had experienced no recurrence of his complaint.

A case of Spasmodic Asthma.

H. R.—, aged thirty-two years. Had laboured under what was called “dry asthma” for nearly sixteen years.

He said that his sufferings at times were such as to render life a burden, and the paroxysms were so severe and frequent as to create the greatest alarm among his friends. He had lost much flesh, and had sought by residence in warm localities to obtain some relief, but without success.

He was immediately placed under treatment, soothing and antispasmodic inhalations being administered frequently during the day.

As there seemed to be no complications arising from inflammation or disorder of any of the other organs, but little stomachic medicine was given, and this only with the view of promoting the appetite and stimulating the digestive function. The attack rapidly subsided, first in severity, and afterwards in frequency, until in the course of a few months he was entirely free from any paroxysm, recovered his loss of flesh, and was enabled to resume full and active employment. He has had no recurrence of his disease within the past three years.

A case of Spasmodic Asthma, accompanied by periodic attacks of Acute Bronchitis.

The subject of this disease was a gentleman aged forty-six years, of large frame, and a highly-sanguine temperament.

When about fourteen years old he was attacked by difficulty of breathing while in a hay-field, and for several years afterwards exhibited all the characteristics of “hay asthma,” the attacks usually coming on at the

flowering season of the year. Gradually, however, the difficulty of breathing became permanent, the spasmodic attacks were frequent and distressing, and at length they occurred almost daily. His rest at this period was very much disturbed, he not being able to sleep continuously through any night.

He had lately, also, been subject to attacks of bronchitis, which recurred with periodical regularity at the change of the seasons. As the result of this long-continued state of suffering, his general health (in spite of a robust constitution) began to give way. When first seen with a view to treatment, there was a constant sense of great oppression of the chest, with short and hurried breathing, a hacking cough, and expectoration of viscid mucus, occasional febrile attacks, inability to exert himself to any extent, and difficulty in retaining the recumbent posture. On examination of the chest, clear evidences were detected of dilatation of the larger bronchial tubes, with more or less interference with the proper expansion of the lung tissue, occasioned by spasmodic contraction of the smaller tubes and filling up of the air-cells with viscid secretion. By the employment of moist inhalations and dry fumigations, used alternately, he soon began to improve; one of the earliest symptoms of amendment being his ability to sleep quietly through the night. The improvement was gradual but uniformly progressive; he soon put on a stout and healthy appearance, was able to resume and fully attend to his occupations, and the intervals between the spasmodic attacks became greater, until they rarely occurred more than once in the year.

In this case we have a disease of thirty years standing checked in its progress to the complete relief of suffering and the perfect restoration of health.

A case of Spasmodic Asthma occurring in a Rheumatic Patient.

This occurred in a young man aged twenty-one years, a clerk in a merchant's office, who had resided for some time in Canada.

There was no evidence of hereditary predisposition, but he had been subject to frequent attacks of bronchitis and rheumatism.

Three years before coming under treatment he first began to experience a difficulty in breathing, which had gradually increased in severity and assumed a periodical character; the intervals between the attacks becoming less and less until at length they occurred nightly, interfering with his proper rest and preventing him from following his employment.

There was at this time constant morning and evening cough, with expectoration of a considerable quantity of a bluish-yellow viscid mucus. He had slight wandering pains through the chest, with a sense of great

constriction. The throat was inflamed and granular, and the voice husky. There was always more or less flushing and heat of skin, and the pulse ranged about 90 beats per minute. He had lost a good deal of flesh, and was much prostrated both bodily and mentally.

A careful examination of the chest established the fact that there was dilatation of the bronchial tubes and air-cells, with several patches of that peculiar condition of the lung tissue called by physicians "emphysema." There was also extensive and diffuse bronchitis.

The chronic character of this case, its severity, and the repeated occurrence of the rheumatic attacks, all contributed to render it a formidable one for any mode of treatment; but by systematically and perseveringly carrying out the treatment and discipline prescribed for him, he has been able to attend to his duties during the last three years and a-half, and is now in the enjoyment of good health, and has become a robust man.

A case of Chronic Bronchitis.

A gentleman, by profession a civil engineer, had a severe attack of acute bronchitis early in the year from which he never entirely recovered, and which, to use his own expression, had "settled upon one lung." He had been variously treated for some time, but without any permanent benefit.

There was great shortness of breathing, much debility, and profuse perspiration on the slightest exertion; coughing was constant and severe, and accompanied by the expectoration of a very sticky mucus. The throat also was much ulcerated, and the tonsils enlarged.

Being naturally a stout man he had lost a great deal of flesh, and was entirely incapacitated from following his professional duties.

He was treated by warm, moist inhalations of an expectorant character, a powerful embrocation was also applied to the surface of the chest, and the air of his bedroom was medicated every night before he retired to rest. After a short time the expectoration became easy, the breathing was relieved, and he began to gain flesh. At the end of three months he discontinued treatment, perfectly restored, and has since continued to enjoy good health.

A case of Chronic Bronchitis, accompanied by Chronic Laryngitis.

A clergyman, aged forty, of robust habit of body, had suffered from repeated attacks of acute bronchitis, which ultimately became chronic, and after some months the symptoms of chronic laryngitis showed themselves. The voice became so much impaired that he was obliged to give up his clerical duties.

A careful examination of the larynx showed considerable thickening and roughness of the mucous membrane, and he had all the well-marked symptoms of dry bronchitis fully developed.

He was under treatment about four months, by means of spray inhalations and frequent applications made with the laryngeal syringe, when all his severe and troublesome symptoms disappeared, and he expressed himself as feeling perfectly well.

A case of constitutional Œzema.

Mrs. C——, thirty-two years of age, of a lymphatic temperament, and member of a consumptive family. Some time previous to being prescribed for she had an attack of scarlet fever, from which she made a slow recovery. Since her convalescence she had frequent discharges of blood from the nose, with occasional pains in the head, attacks of feverishness, and night perspirations.

On examination the nostrils were found dry and irritable, with much difficulty of breathing through them, great huskiness of voice, and an offensive odour of the breath. There was thickening and ulceration of the mucous membrane lining the nasal passages. She had also suffered from suppurating glandular swellings, and a crusty eruption over the head and face. There was slight congestion, loss of flesh, and great prostration of strength. She was placed under treatment with stimulating inhalations, and applications to the nostrils and fauces, by the means of the curved syringe. In the course of three months this patient was so far recovered as to be able to leave London, and while in the country continued the inhalations with great regularity. On her return in the autumn she reported herself as perfectly well in every respect.

A case of severe Scrofulous Œzema, threatening destruction of the nasal bones.

The subject of this interesting case was an unmarried lady fifty-four years of age, of spare habit of body and scrofulous constitution. She had been suffering for eighteen years from chronic catarrh, which had come on very gradually. The discharge from the nostrils was a yellow glairy matter, which occasionally accumulated in the frontal sinuses, producing headache and a sense of tightness in the part, with considerable constitutional disturbance. This condition was followed by a renewed and increased discharge of a thicker and very offensive matter. After a time there was a tendency to the formation of large scabby masses at the back of the nostrils, which occasioned interference with the act of breathing, especially during sleep. These would be occasionally separated by a violent effort, sometimes passing

through the nostrils, sometimes down the throat. This result was frequently followed by copious bleeding from the nose. She had lost considerable flesh, and suffered from hoarseness, with a sense of soreness in the throat. The digestive functions were impaired, but there were no indications of disease in any of the internal organs.

During this long period of illness she had recourse to various methods of treatment, both local and constitutional, without any marked benefit. This obstinate condition seemed almost to preclude a hope of permanent recovery, and required much moral courage on the part of the patient to continue with that perseverance which was so essentially necessary. During the progress of her treatment she has discontinued for intervals of a few weeks at a time, but has always returned to it again with confirmed confidence of its ultimate success. She was placed under dry fumigations, with stimulating inhalations and healing applications by means of the syringes.

All her aggravated symptoms have been mitigated; there are no longer any scabby or offensive discharges from the nose, her general health is fully re-established, and she is able to be less observant of the strict discipline that she was compelled to undergo while under regular treatment.

WRITERS ON INHALATION.

THE following list shows that the subject has not been overlooked, and the names of many modern writers prove that it claims much attention at the present day.

ANCIENTS.—Hippocrates, Dioscorides, Caelius A Cornelianus, Oribasius, Rhazes, Avicenna, Galen, Alexander Trallian, Severinus, Celsus.

BRITISH.—Baillie, Baron, Beddoes, Bennet, Burton, Carlisle, Carpenter, Copeland, Corrigan, Sir A. Crichton, Sir H. Davy, Davidson, Drake, Elliotson, Gardner, Gideon Harvey, Harwood, Mackintosh, Maddock, Morton, Mudge, Sir A. Murray, Pearson, Ramadge, Read, Riadore, Ryan, Salter, Sydenham, Sir C. Scudamore, Smythe, Tweedie, Thomas, Thompson, Thornton, Wansborough, Wittering, Willis, Wilson, Zallony.

AMERICAN.—Coxe, Eberle, Dacosta, Rush, Pringle.

FRENCH.—Andral, Alibert, Bartholin, Bayle, Bertin, Bourgeois, Cottureau, Corvisart, Chevalier, Caillé, Cazenave, Delpit, Desault, Dufresnoy, Desruetz, Dupuytren, Desportes, Ferriér, Foncroi, Galais, Gannal, Laennec, Lisfranc, Louis, Lepais, Maygrier, Mury, Montezau, Martin Solon, Pravaz, Recamier, Richard, Rollier, Thilenius, Trissin.

GERMAN.—Beigel, Blum, Böttcher, Boerhaave, Fust, Huck, Hufeland, Ingenhousz, Kertum, Van Roos, Van Swieten, Turck, Wetzler, Woehler, Zaegel.

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